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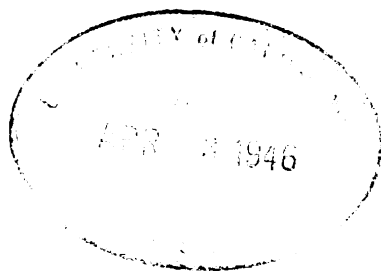
TM 5-600

WAR DEPARTMENT TECHNICAL MANUAL

U. S. Dept. of Army

GUIDES AND PROCEDURES

REPAIRS AND UTILITIES



WAR DEPARTMENT

NOVEMBER 1945

GUIDES AND
PROCEDURES
REPAIRS AND UTILITIES



WAR DEPARTMENT • NOVEMBER 1945

WAR DEPARTMENT
WASHINGTON 25, D. C., 6 November 1945

TM 5-600, Guides and Procedures (Repairs and Utilities), is published for the information and guidance of all concerned.

[AG 300.7 (12 Sep 45)]

BY ORDER OF THE SECRETARY OF WAR:

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G. C. MARSHALL

Chief of Staff

EDWARD F. WITSELL

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The Acting Adjutant General

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Refer to FM 21-6 for explanation of distribution formula.

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**TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES**

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CHANGES
No. 1 }

U.S. WAR DEPARTMENT
WASHINGTON 25, D. C., 15 March 1946

TM 5-600, 6 November 1945, is changed as follows:

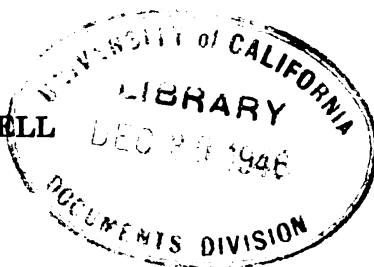
Remove pages 83, 84, 85, and 86 and substitute revised pages 83 and 84; pages 84A and 84B; revised page 85; and page 86.

[AG 300.7 (14 Feb 46)]

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Refer to FM 21-6 for explanation of distribution formula.

Section II. FURNITURE

4.11. Definition

The term *furniture* as used in this manual includes those items of Government-owned furniture authorized for officers' quarters, noncommissioned officers' quarters, barracks and quarters for enlisted and other military personnel, approved civilian quarters, offices, hospitals, and all other War Department owned or controlled buildings and structures at posts, camps, and stations. Furniture on all Transportation Corps vessels, including transports, hospital ships, and harbor craft will be maintained by the Transportation Corps and is excluded from provisions of this manual.

Standard Items of Furniture (R & U maintenance responsibility)

Accessories: Blinds, drapes, pillows (except bed), rugs, shades, shower curtains, slip covers.

Bassinets.

Bathinets.

Beds: Adjustable, barrack, cradles, davenport, day, disappearing, double deck, folding, fracture, hollywood, hospital, obstetrical, standard.

Bed springs: All types.

Benches: Bathroom, bedroom, church, dressing table, garden, greenhouse, mess, office, organ, piano, porch, school.

Bookcases: Library, office, sectional.

Booktroughs: All types.

Breakfast: Sets, nooks.

Buffets: All types.

Bureaus: All types.

4.11.1. Distinction From Equipment (Added)

A definite distinction between furniture and equipment, either peculiar to any one service or common to two or more services, should be made in all instances. The following lists are provided as a guide to determine Standard Items of Furniture (for which Repairs and Utilities has maintenance responsibility) and Items Other Than Furniture (which are the responsibility of various services in accordance with existing regulations). The provisions of this manual are applicable to those items appearing in the list of Standard Items of Furniture, and which are defined as *furniture*. Suggested revisions and the addition of new items to the lists, may be referred to the Repairs and Utilities Division, Office, Chief of Engineers, for consideration and inclusion in future revisions.

Items Other Than Furniture (responsibility of various services in accordance with existing regulations)

Altars.

Back rests.

Bars: Breakfast, cocktail, hotel, restaurant.

Baskets: Laundry.

Benches: Jewelers, laundry, shop, washtub.

Bins: Industrial, post office, vegetable.

Boards: Blackboard, bulletin, directory, hymn.

Booths: Confessional, telephone.

Boxes: Mail, post office, safe deposit.

Standard Items of Furniture (R & U maintenance responsibility)

Cabinets: Attendants, chemical, corner curio, dish, filing, janitors, key, kitchen, linen, medicine, music, office, radiator, radio, record, seed, sewing, supply.

Chairs: Adirondack, arm, auditorium, barrack, beach, boudoir, bridge, common, desk, dining room, folding, high, invalid, kitchen, ladder, library, living room, lounge, morris, occasional, office, piano, porch, reception, reclining, revolving, rocking, rustic, typist, upholstered.

Chaise lounges: All types.

Chests: Cedar, chiffoniers, chifforobes, highboy, hope, lowboy, underbed.

China closets: All types.

Clocks: Electric, manually wound, wall.

Costumers: All types.

Cots: Folding, steel.

Couches: Living room, office, studio.

Covers: Radiator.

Cupboards: China, kitchen.

Desks: Appointment, attendants, bookcase, check, chemistry, filing, Governor Winthrop, kidney, kneehole, laboratory, living room, nurses, office, office machine, reception, secretary, slant front, spinet, typewriter.

Dressers: All types.

Fireplace sets: All types.

Gliders: Garden, porch.

Lamps: Adjustable, for bed, desk, flexible arm, floor, table.

Ladders: Bunk bed.

Lockers: Wall.

Mirrors: Wall.

Ottomans: All types.

Pedestals: All types.

Racks: Baggage, book, card, chart, clothes, hall, hat, luggage, magazine, post card, record, towel, umbrella, wall.

Items Other Than Furniture (responsibility of various services in accordance with existing regulations)

Cabinets: Dental display, film storage, ice cream storage, instrument, ironing board, sewing machine, shop, specialists ENT.

Card: Food.

Carriages: Dressing, wheeled.

Cases: Display, exhibit, laboratory.

Chairs: Dental operating, fixed, fountain, lunch counter, specialist, switchboard attendants.

Chests: Burglary resistive, ice storage, storage.

Conveyors: Linen.

Counters: Bank, bar, cafeteria, display, hotel, lunch, restaurant, store.

Diathermy apparatus.

Dry-cleaning equipment.

Gates: Office, swinging.

Hampers: Clothes.

Lamps: Operating and therapeutic.

Ladders: Step.

Laundry equipment.

Litters: All types.

Machine: Sewing.

Mattresses: Box, cotton, innerspring.

Organs.

Physical reconditioning equipment.

Pianos.

Pillows: Bed.

Public address system.

Racks: Display, laboratory, mail bag, pew, tool.

Railing: Office.

Standard Items of Furniture (R & U maintenance responsibility)

Screens: Bed.
 Settees: Love seat.
 Shelves: Book.
 Sofas: Living room, office, upholstered.
 Stands: Bedside, book, dictionary, luggage, post card, smoking, typewriter, umbrella.
 Stools: Accountants, bathroom, cashier, common, dairy, draftsman, dressing table, filing, foot, foot-rest, office, organ, piano, revolving.
 Tables: Banquet, bath, barbecue, beach, bed, bedside, bookshelf, bridge, cigarette, classroom, coffee, console, directors, dining room, draftsman, dressing, drum, end, gateleg, invalid, kitchen, lamp, living room, magazine, office, overbed, picnic, poker, powder, radio, reception, serving, sewing, tabourette, typewriter.
 Towel receptacles: All types.
 Trays: Bed, card index, desk, reading.

Wagons: Tea, cocktail.
 Wardrobes: All types.
 Wastepaper receptacles: All types.

4.12. Procurement

a. **FURNITURE.** The Procurement Assignment Board has assigned procurement responsibility for specific items of furniture to certain technical services. (See app. 1, WD Procurement Reg.) The Corps of Engineers is *not* assigned any procurement responsibility for furniture.

For the duration of the war, procurement of wall lockers and all heavy furniture for officers', warrant officers', and noncommissioned officers' quarters is suspended. Furniture for troop housing is listed in T/A 20, and is obtained by requisition through the Quartermaster Corps. Furniture for enlisted men's day rooms and recreational rooms and for officers' clubs and officers' day rooms is to be purchased from nonappropriated funds. (See AR 210-50.) Portable furniture for domestic post offices at posts, camps, and stations within continental United States is furnished by the Post Office Department and procured from funds in an allotted status at quartermaster regional supply depots.

Items Other Than Furniture (responsibility of various services in accordance with existing regulations)

Safes: Burglary, resistive, combination lock, deposit box, fire resistive.
 Screens: Confessional, exhibit, projection.
 Stands: Cashier, display, lecture, shoeshine.
 Stools: Bar, fixed, fountain, counter.

Tables: Autopsy, bakers, biology, cafeteria, communion, cutting, examining, industrial, instrument, mail sorting, obstetrical, operating, orthopedic, room service.
 Typewriters.

Vacuum cleaners: Domestic industrial.
 Washing machines: Domestic.

b. **SPARE PARTS.** Regardless of whether furniture is to be repaired by purchase and hire or by contract, necessary spare parts will be procured with available funds by the technical service responsible for procuring the item to be repaired. The post engineer may fabricate spare parts for furniture and wall lockers if they are not available upon requisition or by local procurement.

4.13. Local Manufacture

For policy governing local manufacture of furniture, see paragraph 4.5.

4.14. Maintenance Responsibility

a. **GENERAL.** Maintenance, alteration, and repair of furniture are repairs and utilities responsibilities. Commanding generals of service commands (for class I, II, and IV installations) and air forces or AAF commands (for class III installations) will be responsible for supervising this work as part of their repairs and utilities responsibilities. (See AR 170-10, 100-80, and WD Cir. 388, 1944.)

b. SPECIAL EQUIPMENT. Repairs and utilities is not responsible for maintenance and repair of special equipment peculiar to any service, unless the responsibility is specifically assigned.

c. LEASED FURNITURE. The post engineer may use repairs and utilities funds to repair furniture leased with a building. If the lessor furnishes services including maintenance and operation, the post engineer is not responsible for repairing damages to leased furniture in excess of ordinary wear and tear, damages by the elements, and damages resulting from circumstances over which the Government has no control. The Government is responsible for damages due to negligence or the commission of waste. In every case, the extent of the Government's liability should be determined from the lease agreement for the building.

d. CRITICAL ITEMS. There will be no restriction on repairing furniture or wall lockers listed in SB 38-1 as being in a critical supply status.

4.15. Repair

a. AT STATION LEVEL. The post engineer will repair only furniture which is in use or currently needed for use at the station and for which he has facilities, materials, and personnel available. Furniture for depot stock will be repaired in accordance with instructions issued by commanding generals of the service command (for ASF depots and depots under chiefs of technical services) and of the air technical service command (for air technical service command depots). Post engineers will not repair furniture which they considered to be beyond economical repair. Such furniture will be disposed of through salvage.

b. PERFORMANCE OF REPAIRS BEYOND AVAILABLE FACILITIES AT STATIONS. Unserviceable furniture not currently needed for use, or that requiring repairs beyond the capabilities of available post repair facilities or personnel, will be reported by the installation commander to the commanding general of the service command for class I, II, and IV installations and to the commanding general of the air force or command concerned for class III installations. These commanders will furnish necessary instructions to effect repairs of unserviceable furniture utilizing facilities provided by the service command engineers.

c. DISPOSITION OF NONREPARABLE AND REPAIRED FURNITURE. If the service command engineer determines that unserviceable furniture reported to him for repair is not repairable, he will request the appropriate air force command or the service command concerned to issue disposal instructions. When unserviceable furniture is shipped to the service command engineer for repair, the installation commander is responsible for furnishing, at the time of shipment, the applicable instruction for disposition upon completion of repair, as indicated below:

(1) Return to consignor.

(2) Report as excess to the specific appropriate technical service distribution depot for disposition in accordance with TM 38-220.

4.16. Bins, Shelving, and Wall Lockers

The Corps of Engineers is responsible for specifications, requirements, funds, purchase, and inspection of locally constructed bins, shelving, and wall lockers, either attached to a building or detached. Responsibility for specifications, purchase, and inspection of commercially manufactured bins, shelving, and wall lockers is assigned to the Quartermaster Corps. The using service is responsible for determining requirements and furnishing funds. Maximum economy will be enforced in all such installations, consistent with minimum essential requirements of the using service.

a. SHELVES AND CLOTHES RACKS. In barracks without minimum amount of shelves and clothes racks or where double bunking has been authorized, the post engineer will be authorized to build the required shelves and clothes racks from available repairs and utilities funds. Such construction must become permanently installed property constituting part of the real property; it will be installed only if absolutely necessary to proper utilization of the barracks, and will conform as nearly as possible to standards prescribed in the mobilization and theater of operations 700-series drawings. Each request for additional shelving or clothes racks should be carefully examined for

conformance with the Directive for Wartime Construction and AR 100-80. All justification should clearly indicate why the requested work is essential to proper utilization of the barracks.

b. BREAD CABINETS. Bread and pastry can be fully protected by door and window screens properly installed and maintained. Therefore, installation of screened bread and pastry cabinets should not be approved.

4.17. Mess Tables and Stools

Standard quartermaster mess tables and stools will no longer be issued to equip new messes. The post engineer will repair quartermaster tables and stools already installed in messes under the same policy governing other furniture repair, provided that replacement parts are available at the post or obtainable from existing stock. Unsuitable tables and stools will be salvaged in accordance with provisions of AR 700-25 when existing stocks of standard quartermaster mess tables and stools and their replacements have been depleted. The post engineer will replace salvaged items with the type mess tables and benches now provided cantonment type mess halls. Cantonment type mess tables will not be dressed up after initial construction by adding metal or composition edges, linoleum tops, or similar refinements.

4.18. Bedsteads and Cots

Maintenance of cots and beds has been interpreted as falling within the scope of general maintenance, and therefore will be performed in the combined shop, if available, or by the post engineer. The local post commander will determine which facilities are more suitable for the work.

TM 38-220 provides for establishing a 15-day model stock of standard repair parts for cots and beds at the shop performing the maintenance, in addition to normal stock authorized for the station. This model stock will be replenished as necessary from regular stocks. Standard requisitionable parts, therefore, will be secured from the post quartermaster; labor and materials purchased or parts fabricated locally will be an expense of the local shop. Where maintenance and repair are to be performed by the post engineer, he should advise the quartermaster supply officer of the initial model-stock requirements and anticipated changes in demand.

4.19. Nonstandard Furniture

Nonstandard furniture will be repaired by the post engineer in accordance with policies for repairing standard items. If the post engineer believes these articles are basically too fragile or for any other reason unsuitable for the immediate intended use, he will not repair them even though the repair could be made economically.

Section III. PACKING AND CRATING

4.20. General

All packing and crating at class I and II installations is a repairs and utilities responsibility. This includes ordnance shop packing and crating. Employees whose time or major portion thereof is utilized in packing and crating at class I and II installations are properly chargeable to repairs and utilities funds. Repairs and utilities funds will be used without reimbursement at class I and II installations to purchase necessary lumber, supplies, and materials. Twine, wire strappings, nails, box-strapping seals, wrapping paper, and other supplies stocked by QMC will be provided by QMC depots from stock without reimbursement or QMC depots will make funds available therefor. Packing and crating may be done by contract where necessary. The above procedures apply at class IV installations, except manufac-

turing plants, proving grounds, depots, arsenals, and ports of embarkation. All packing and crating activities, including household effects, will be the responsibility of the respective technical services at such excepted class IV installations and funds will be provided through technical service channels. Packing and crating activities, including household effects, at class III installations are not considered to be a repairs and utilities function, but will be performed and paid for from funds as directed by the Commanding General, AAF.

4.21. Baggage-Car Conversions

Cost of baggage-car conversion accomplished by the post engineer for transporting troops or prisoners of war is chargeable to the same funds as packing and crating. (See par. 4.20.)

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TECHNICAL MANUAL GUIDES AND PROCEDURES REPAIRS AND UTILITIES

CHANGES
No. 2

U.S. WAR DEPARTMENT
WASHINGTON 25, D. C., 5 April 1946

TM 5-600, 6 November 1945, is changed as follows:

Remove pages 65 and 66 and substitute page 65 and revised page 66, and add new page 66A herewith.

[AG 300.7 (20 Mar 46)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

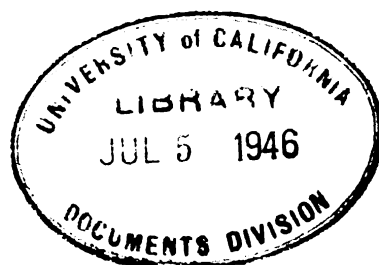
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Refer to FM 21-6 for explanation of distribution formula.

AGO 3380A—Apr.



Section V. SNOW REMOVAL AND WINTER MAINTENANCE

3.27. Responsibility

Snow-removal service is a repairs and utilities function.

3.28. Snow Removal at Landing Fields

The commanding officer of an airfield will be responsible for setting the standards for snow removal and winter maintenance at the field. Maintenance should be governed by the following standards:

a. In continental United States, snow will be removed from runways.

b. At Air Transport Command airdromes, work should be conducted so there will be little or no interruption in use of landing-field facilities.

c. At the discretion of the commanding officer of the installation, airfield use may be suspended to permit efficient operation of snow-removal equipment.

d. In general, runways will be considered usable in emergency when the cleared area is 150 feet wide, and when snow banks within 100 feet of either side of the cleared area are no more than 3 feet high and are sloped at the edges adjoining the cleared runway.

3.29. Ice Alleviation

Minimum amounts of calcium chloride or sodium chloride may be mixed with aggregates to produce proper braking surfaces for airplane traffic. Alkalinity of sand-chloride mixtures may be reduced by solution treatment and by storing mixtures for 10 to 30 days before use.

Section VI. GROUNDS

3.30. General

a. RESPONSIBILITY. The post engineer's grounds-maintenance responsibilities include revegetation, renovation, fertilization, and grass mowing, and the use and care of all incidental maintenance equipment. Grounds-maintenance and dust- and erosion-control technicians on the staffs of service command engineers will supervise projects and assist in programs for maintaining and expanding vegetated areas and dust- and erosion-control work at class I, II, and IV installations. They will give technical assistance to class III installations when requested and will make technical inspections of class III installations to insure that prescribed standards, procedures, and policies are being followed. Service command engineers and AAF commands can get help from organizations such as the U. S. Department of Agriculture, U. S. Department of Interior, and State Agricultural Experiment stations in preparing plans, recommendations, and specifications for revegetation projects under consideration.

b. LIMITATIONS. Revegetation and dust- and erosion-control projects will not include work done merely as a contribution to *beauty*, convenience, comfort, or prestige. The level of work should be no higher than needed to keep property in serviceable condition. Civilian gardeners at class I, II, III, and IV installations will be paid from repairs and utilities funds when their work meets the "spartan simplicity" standard set in paragraph 2.1b, is necessary grounds maintenance, and is a part of the repairs and utilities responsibility of the Commanding General, AAF, or the commanding general of the service command. Under restrictions imposed by War Department economy directives, landscaping, grounds beautifying, maintenance of flower beds and boxes, and greenhouses, except as listed in *c* below, and similar work are not proper charges

against repairs and utilities funds. Expenditures will be made for revegetation and dust and erosion control only when the work is utilitarian and results in a net savings to the War Department.

c. GREENHOUSES. (1) The maintenance and furnishing of utilities services to War Department owned or controlled greenhouses at general and convalescent hospitals in connection with the *convalescent reconditioning program for patients* is a repairs and utilities responsibility under AR 100-80, to be accomplished from ESA project 300 funds. The Commanding General, ASF (for class I, II, and IV installations) and the Commanding General, AAF (for class III installations) will be responsible for the maintenance of greenhouses and furnishing of utilities services at general and convalescent hospitals, and for the maintenance of grounds, including lawns, trees, and shrubbery, as part of their repairs and utilities responsibilities as prescribed by AR 100-80, and WD Circular 388, 1944. This responsibility includes the furnishing of qualified personnel necessary for such maintenance and utilities services, but does not include any greenhouse supervisory or operating personnel.

(2) The furnishing of greenhouse supervisory or operating personnel and of such tools, equipment, seeds, cuttings, supplies, etc., as may be required for use by patients in connection with the convalescent reconditioning program is a responsibility of The Surgeon General.

3.31. Grounds-maintenance Personnel

To insure effective dust and erosion control and protect the War Department's investment in vegetative cover, experienced grounds-maintenance supervisors should be employed at AGF and AAF stations whenever warranted by the acreage of grounds to be maintained and the responsibility involved.

3.32. Street and Area Marking Signs

The post engineer is responsible for preparing, erecting, and maintaining street and area marking signs. Traffic-control signs and pavement markings will conform to provisions in TM 5-624 (when published).

3.33. Policing

a. GENERAL. General policing, such as picking up paper and cigarette butts, is not a grounds-maintenance responsibility of the post engineer under AR 100-80 and is not properly chargeable against repairs and utilities funds. Enlisted personnel and prisoner labor may be used for this work; where prisoners of war are available, they should be used to a maximum. (See pars. 1.33 and 1.34.)

b. AIRFIELDS. Grassed areas in airfields must be policed before mowing to prevent excessive damage to mowing equipment and the need for costly repairs. This is the post engineer's responsibility. (See AR 100-80.) Refuse and debris can best be removed from the airfield immediately after planting and before the surface is overgrown. These areas should be policed periodically as part of regular grounds-maintenance operations, with available prisoner labor and/or prisoners of war doing the work whenever possible.

c. VEGETATED AREAS. AR 100-80 makes the post engineer responsible for policing vegetated areas not near occupied buildings; debris such as rocks, wire, and lumber which would interfere with grounds-maintenance operations of mowing, soil-erosion control, drainage, etc., must be removed. Repairs and utilities funds can be used for this work.

TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES

CHANGES
No. 3

U.S. WAR DEPARTMENT
WASHINGTON 25, D. C., 15 May 1946

TM 5-600, 6 November 1945, is changed as follows:

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[AG 800.7 (15 May 46)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

DWIGHT D. EISENHOWER
Chief of Staff

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(5); Rehab C (Att Eng) (5); PW Cp (Att Post Eng) (5); D (Eng) (2).

Refer to FM 21-6 for explanation of distribution formula.



Section V. MESS AND INSTALLED EQUIPMENT

4.25. Installed Equipment

Requests for equipment which requires installation should be submitted as project requests on WD AGO Form 5-25 when the estimated cost of equipment and installation exceeds \$1,000. This will eliminate the possibility of equipment being shipped on requisition and then having its installation disapproved.

4.26. Mess Equipment

a. DEFINITION. Mess equipment as used herein includes the following power-operated, installed, or immovable equipment, mess:

(1) Equipment, mess, including kitchen, meat cutting, rendering, and pastry baking.

(2) Army ranges.

(3) Refrigerators and refrigeration equipment listed as follows:

(*a*) Household type (up to 18 cu. ft.)—for new facilities; ice cube makers (up to 48 pounds per freeze); and ice chests (up to 400 pounds).

(*b*) Prefabricated — reach-in/walk-in type; walk-in type; and frozen food type.

(*c*) Commercial type (over 18 cu. ft.).

(*d*) Power-operated ice cream freezers (20-40 gal.).

b. ASSIGNMENT OF RESPONSIBILITY. The following assignment of responsibilities is stated:

(1) *Quartermaster Corps.* (*a*) Specifications.

(*b*) Purchase and inspection, except authorized local procurement of repair parts.

(*c*) Storage and issue including control of stock.

(*d*) Property accounting.

(2) Repairs and utilities.

(*a*) Requirements and funds.

(*b*) Authorized local procurement of repair parts.

(*c*) Installation and removal.

(*d*) Maintenance and repair.

(*e*) Formulation and publication of Army-wide standards, policies, and procedures relating to installation, removal, maintenance, and repair.

c. AUTHORITY FOR INSTALLATION AND REMOVAL. Determination of authority for installation of equipment, mess, will be based on the

provisions of AR 100-80 and paragraph 1.63.

(1) Installations involving a cost, including the value of the equipment, of \$1,000 or less may be approved by the post commander only when in accordance with the Tables of Allowance established in TM 5-603 (when published).

(2) Requests for approval for installations where the cost, including the value of the equipment, is estimated to exceed \$1,000 will be processed on an Individual Project Estimate (WD AGO Form 5-25).

(3) Requisitions for equipment required in excess of the allowance established in TM 5-603 will include detailed justification and sketch of proposed lay-out.

(4) Prior approval for the use of the fuels must be obtained from the Chief of Engineers through appropriate channels and this approval noted on the requisition for:

(*a*) New installations proposing to use gas (including liquefied petroleum gas), oil, or electricity.

(*b*) Replacements or additions which will result in an increased use of fuels referred to in (*a*) above.

(5) When the conversion of a building in which equipment, mess, is installed has been approved by competent authority, the post engineer will remove the equipment and, unless an authorized local requirement exists, will return it to the station supply officer, who will report it to the appropriate quartermaster depot for disposition instructions. The condition of the equipment will be adequately described in the report to the appropriate depot.

d. SUPPLY PROCEDURE. Allowances for mess equipment will be based on tables contained in TM 5-603. Requisitions for mess equipment at posts, camps, and stations in continental United States will be forwarded as outlined below and *not* direct to the supplying depots:

(1) Requisitions from class I, II, and IV installations will be forwarded by the station supply officer to the commanding general of the service command, Attn: service command quartermaster, for editing, technical review (including coordination with service command engineer on structural and fuel requirements), and approval.

(2) Requisitions from class III installations will be forwarded in accordance with the instructions of the Commanding General, AAF.

(3) Requisitions approved under (1) and (2) above will be forwarded to The Quartermaster General, Attn: Storage and Distribution Division, General Supplies Branch.

(4) Where approval for installation or use of fuel must be obtained, as set forth in *c* (2), (3), and (4) above, the requisition will be submitted as an inclosure to WD AGO Form 5-25 (Individual Project Estimate), or request for approval of use of fuel, through established channels.

(5) Upon approval of projects or requests submitted in accordance with (4) above, the approving authority will withdraw the requisition from the correspondence and forward it as stated in (3) above.

e. SUPPLY PROCEDURE FOR REPAIR PARTS. Requisitions for repair parts for ranges, Army Nos. 3, 3A, and 5, originating at posts, camps, and stations will be forwarded direct to appropriate quartermaster key depots for supply without reference to OQMG. Repair parts, other than those for range, Army Nos. 3, 3A, and 5, required by posts, camps, and stations within the continental United States will continue to be procured from repairs and utilities funds available locally, except repair parts, indicated as centrally procured by OQMG (with concurrence of the Chief of Engineers) or available from service command repairs and utilities warehouses or excess lists, will not be procured locally. Centrally procured items will be requisitioned direct from appropriate quartermaster key depots without reference to OQMG. Items available from service command repairs and utilities warehouses or excess lists will be requisitioned from the service command engineer.

f. ACCOUNTABILITY. Accountability for equipment, mess, and repair parts for Army ranges Nos. 3, 3A, and 5 at posts, camps, and stations within the continental United States will be taken up on the quartermaster section of the stock record account. Installed equipment, mess, will be recorded on the quartermaster section of the installed property records. Accountability for repair parts, other than those

procured through quartermaster channels, will be taken up on the repairs and utilities stock record account until issued for use. Such issues will be made on the authority of WD AGO Form 5-35 (Repairs and Utilities Work Order).

g. Costs. The cost (or value) of all items of equipment, mess, and repair parts obtained through quartermaster channels will be furnished the post engineer by the station supply officer as the items are issued. The cost (or value) of all equipment or repairs thereto will be entered in the repairs and utilities cost accounts.

h. EQUIPMENT FOR MESSSES OPERATED UNDER AR 210-60. Equipment furnished to messes and necessary for operation of the mess halls within the authorized strength of personnel will be provided upon requisition through central procurement from repairs and utilities funds. The same procedure will be followed for replacement of equipment destroyed by fire, storm, etc., due to normal wear and tear, or in event the authorized strength is increased above the designed capacity of the mess hall. Equipment desired for serving personnel other than that authorized or extra equipment for convenience cannot be provided from repairs and utilities funds, but may be secured locally from the funds of the organization operating the mess hall, restaurant, etc.

4.26.1. Maintenance, Repair, Disposal and Shipment of Mess Equipment

a. GENERAL. The following procedures will be followed in the repair, disposal and shipment of mess equipment, power-operated, installed or immovable, at class I, II, III, and IV installations, and will serve as a guide to all concerned.

(1) The Quartermaster General has the responsibility for storage and issue of mess equipment. All maintenance and repair of such mess equipment is a repairs and utilities responsibility to be performed by the post engineer, from ESA Project 300 funds, in accordance with technical procedure, policies and standards prescribed by the Chief of Engineers in TM 5-636, TM 5-637, and TM 5-641.

(2) Serviceable mess equipment of the type designated as critical in the latest list issued by The Quartermaster General, and excess to the

requirements of an installation, will be shipped as directed herein to other installations, or to one of the following key Quartermaster Depots:

(a) Jeffersonville QM Depot, Jeffersonville, Indiana.

(b) QM Section, San Antonio ASF Depot, Grayson Street Station, San Antonio, Texas.

(3) Equipment not listed as critical on the current list issued by The Quartermaster General will be repaired only if needed locally. Non-critical equipment of any class, including class A (new) if not needed locally, will, upon advice of the post engineer be declared surplus by the accountable supply officer (post quartermaster) and disposed of.

b. CLASS "B" EQUIPMENT. Class "B" equipment (used equipment ready for immediate use) will be shipped to the post engineer of the appropriate key quartermaster depot listed in *a* (2) above, upon the obtaining by the service command engineer of the concurrence of such depot, and specific instructions for shipping thereto. Before shipment the following will be accomplished:

(1) The post engineer will check motors and make necessary minor repairs.

(2) The post engineer will clean equipment thoroughly inside and out, and touch up damaged painted surfaces with paint similar to adjacent painted surfaces.

(3) The accountable supply officer (post quartermaster) will mark equipment crates or cartons plainly, giving proper Quartermaster Corps nomenclature and stock number and class of equipment (A, B, or C).

c. CLASS "C" EQUIPMENT. Before class "C" equipment (unserviceable equipment which can be economically repaired), which cannot be locally repaired is shipped as directed in *d* below, the following will be accomplished.

(1) The post engineer will clean thoroughly inside and out, and touch up damaged painted surfaces with paint similar to adjacent painted surfaces.

(2) The accountable supply officer (post quartermaster) will mark equipment crates or cartons plainly, giving proper Quartermaster Corps nomenclature and stock number, and class of equipment (A, B, or C).

d. REPAIR OF CLASS "C" EQUIPMENT. Class "C" equipment will be repaired as follows:

(1) Equipment which is economically repairable, will be repaired by the post engineer within the capabilities and scope of his organization. When it is beyond the scope of his organization, it will be referred to the service command engineer for instructions. The service command engineer will instruct the post engineer to do one of the following:

(a) Repair the equipment by local contract.

(b) Evacuate it to a service command shop or to a shop of another installation in the service command having sufficient facilities.

(2) If equipment is found to be beyond economical repair, it will, with the approval of the service command engineer, be reclassified as class "D" (equipment which is unserviceable and beyond economical repair).

e. CLASS "D" EQUIPMENT. Class "D" equipment will be disposed of by the post engineer and the accountable supply officer (post quartermaster) as follows:

(1) Cannibalized by the post engineer for usable repair parts and components.

(a) Usable repair parts and components for Nos. 3, 3A and 5 Army ranges will be picked up on the accountable supply officer's (quartermaster) property records.

(b) Other usable repair parts and components will be taken up on post engineer property accountable records.

(2) Equipment after cannibalization will be turned over to the post salvage officer.

f. REPAIR OF DEPOT STOCK. Because of improper classification or due to damage in transit resulting from poor packing or other causes, some equipment is arriving at the key quartermaster depots in unserviceable condition. In order to put such equipment in serviceable condition, the appropriate service commands will instruct post engineers at the key quartermaster depots listed in *a*(2) above that the instructions of *d* above are also applicable for the repairing of depot stock. The quartermaster depot post engineer will repair equipment prior to turning it over to depot stock. If considered advisable, the appropriate service command engineer may prescribe that commercial facilities

ties, or the post engineer of an adjacent station, be responsible for repair of class "C" equipment stored in or received at the key quartermaster depots.

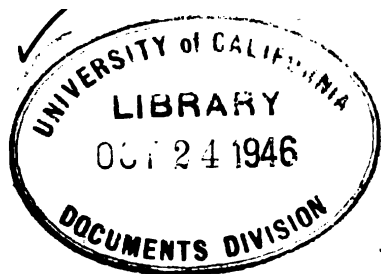
g. EQUIPMENT FROM OVERSEAS OR SURPLUS INSTALLATIONS. The procedure outlined above will be followed in connection with mess equipment received from overseas, and for mess equipment at installations declared or to be declared surplus.

4.27. Butcher Blocks

Butcher blocks, 30 x 30 x 16 inches, will be issued by the Quartermaster Corps in accordance with T/A 20.

4.28. Dishwashing Facilities in Diet Serving Kitchens of General Hospitals

To provide proper facilities for washing and sterilization of dishes, the installation of spray rinse



TM 5-600
C 4

TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES

CHANGES
No. 4

US WAR DEPARTMENT
WASHINGTON 25, D. C., 12 September 1946

TM 5-600, 6 November 1945, is changed as follows:

Remove pages 37 through 40 and substitute page 37, revised page 38, new page 38A, revised page 39, and page 40.

Remove pages 125 through 128 and substitute page 125, revised pages 126, 127, and 128, and add new page 128A.

Remove pages 131 and 132 and substitute revised pages 131 and 132, and add new page 132A.
[AG 300.7 (20 Aug 46)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

DWIGHT D. EISENHOWER
Chief of Staff

DISTRIBUTION:

AAF (2); AGF (5); T (Eng) (10); Dept (Eng) (5); Base Comd (10); Def Comd (Eng) (10); HD (Eng) (5); Tech Sv (2) except OCE (75); AAF Comds (Air Instls) (ZI) (10); AAF Comds (Eng) (Overseas) (2); AMA (Air Instls) (5); FC (Post Eng) (5); BU (Eng) (Overseas) (2); Class III Instls (Eng) (5); PE (Eng) (5); Ars (Post Eng) (5); Dep (Eng) (5); Dist 5 (2); Div (Eng) (10); GH (Post Eng) (5); RH (Eng) (5); CH (Post Eng) (5); A (2); A (Eng, R&U) (10); D (Eng) (2); Bn (Eng) (Overseas) (2); AF (Air Instls) (ZI) (5); AF (Eng) (Overseas) (2).

For explanation of distribution formula, see FM 21-6.

the service commands or commanding generals of air forces or AAF commands. Requests for construction of vestibules on other buildings and in other temperature zones will require complete justification.

2.13. Theater Exits

a. BUILDINGS AFFECTED. Two exits besides those provided by original plans will be added in all existing buildings of the following types which have not been altered:

(1) Training auditorium, type TA-AT, drawings TO 700-5825 to 5830, inclusive.

(2) Theater, type TH-3, drawings 700-1212 to 1224, inclusive.

(3) Theater, type TH-1038-P, drawings 800-486 to 498, inclusive.

(4) Theater, type TH-1038-S, drawings 800-500 to 514, inclusive.

b. ALTERATIONS. The additional exits will be approximately centered in each of the side walls. They will be the same width as those near the front of the building, and will have similar double doors, opening out. Stairs will be provided with handrails on both sides. Panic bolts will be provided for exit doors of all assembly buildings accommodating more than 100 occupants. Where necessary, two rows of seats will be removed to form a continuous aisle between the additional exits. Remaining seats should be fixed firmly to the floor.

2.14. Insulation

a. WHERE AUTHORIZED. (1) *Localities.* Insulation deficiencies may be corrected in all types of buildings in northern climates, within the limitations outlined in TM 5-613 (when published). Ordinarily, only stations in the 0° and -20° temperature zones should require insulation.

(2) *Buildings.* Insulation should be limited to buildings in the first, second, and third priority groups: hospital buildings used by patients and visitors; barracks and quarters; and administration buildings. In special cases, insulation may be approved for structures in other priority groups if, in the opinion of the commanding general of the service command, it is sufficiently justified.

b. INSTALLATION. For materials and installation methods, see TM 5-613.

2.15. Plumbing

a. TOILET FACILITIES. (1) *General.* Additional toilet fixtures may be installed only when conversion of existing facilities is impractical. Justification for each project will include the number of persons to be served and the location of existing toilet facilities. Generally, work areas should be within 600 feet of the nearest toilet room. For the number of fixtures required in a building, see TM 5-619 and the table below.

(2) *Warehouses and shops.* Existing toilet facilities in warehouses, shops, and similar buildings often require conversion because of the increasing employment of civilian women. The schedule in TM 5-619 for providing fixtures is amended for civilian occupancy as follows:

NUMBER OF EMPLOYEES PER FIXTURE

<i>Employees</i>	<i>Water closets</i>	<i>Lavatories</i>	<i>Urinals</i>
Male	20	20	40
Female	14	20	0

Wherever possible, toilet facilities should be provided women by assigning them a number of existing toilet rooms, rather than subdividing all toilet rooms into two separate compartments. The latter alternative may be necessary in cases where toilet facilities would otherwise be too far from employees. Toilet facilities may be further subdivided to provide for separation of white and Negro personnel.

(3) *Types of fixtures.* For types of fixtures to be installed, see TM 5-619. Deviation from this specification is *permissible* where facilities of a *temporary nature* are installed in buildings such as warehouses, shops, etc., which may be classified as temporary. Permissible variations include:

(a) Trough urinals with automatic high-flush tanks.

(b) Automatic high-flush tanks for urinals placed in batteries of three or more fixtures. One tank should be installed for each battery.

(c) Trough wash basins or other types of group lavatories.

b. DRINKING FOUNTAINS. The number of drinking fountains installed in a building is prescribed in TM 5-619. For sanitary reasons, installing them within toilet rooms should be avoided; however, those now installed in toilet rooms will not be relocated.

c. **WATER SUPPLY SYSTEM.** During all installation, alteration, repair, and inspection, all potable-water supply piping should be checked carefully for one of the potentially dangerous connections listed below. Dangerous cases will be corrected immediately, using protective measures prescribed in TM 5-619. Dangerous connections include:

(1) Interconnections between potable- and nonpotable-water lines.

(2) Fixtures with under-rim water supply connections that may become submerged in use of the fixture.

(3) Fixtures having over-rim supplies with inadequate air gaps.

d. **HOT-WATER SUPPLY SYSTEMS.** Hot-water supply systems should be provided in all buildings *equipped* with plumbing fixtures normally *equipped* with hot-water connections, where the occupational use definitely establishes the need for hot water. In warehouses, shops, and similar buildings where only a few lavatories are served or where lavatories are more than 200 feet apart, installation of hot-water supply systems may not be warranted. In such cases, alternate lay-outs or methods for providing hot water should be submitted for each project with justification based on local conditions.

e. **FLOOR DRAINS.** Floor drains should not be installed in locations where sewer gas may escape if drain traps are flushed infrequently. Precautions should be taken to insure that traps of existing floor drains are water-sealed at all times.

f. **GREASE INTERCEPTORS.** The post engineer is responsible for training mess personnel in proper maintenance of the grease interceptors installed in or near mess halls to collect grease from greasy wastes. For methods of removing grease and cleaning interceptors, see TM 5-619.

2.16. Painting

a. **GENERAL.** (1) Buildings, utilities, and other facilities known to be required for future active use at installations to be retained for the active peacetime Military Establishment as set forth in the "War Department Program of Installations" will be scheduled to receive maintenance painting and repainting to reach normal peacetime standards.

(2) Each responsible command of the War

Department will program and authorize such work only within the available material, personnel, equipment, and quarterly allotment of appropriated funds. Funds for any other regular recurrent operation and maintenance will not be diverted to increase standards of painting. In view of the shortage of funds, the standards prescribed herein cannot be attained during fiscal year 1947. Therefore, painting and repainting will be accomplished in accordance with, and within, the priorities outlined hereinafter.

b. **STANDARDS.** (1) It is intended that the wartime level of maintenance painting and repainting with respect to permanent buildings, utilities, and other facilities will be progressively raised until it reaches standards equal to the maximum economical standards normally applied in good commercial practices.

(2) Other buildings, utilities, and various facilities such as permanent (of limited utilization), mobilization, T/O modified, and other temporary types will be restricted to maintenance painting and repainting consistent with the type, future use, projected need for, and economic life expectancy of the individual facility.

c. **EXTERIOR PAINTING.** (1) *Active installations.* Painting and repainting of permanent and mobilization-type buildings for troop housing and appurtenant facilities at installations, or portions thereof, which are approved by the War Department for retention as a part of the active permanent military establishment will be progressively brought up to maximum economical peacetime standards. This painting and repainting will be accomplished in accordance with the following priorities:

(a) Permanent buildings and facilities—sash, doors, trim, and all exterior exposed metal and wood.

(b) Hospitals of all types of construction—sash, doors, trim, and all exposed metal and wood.

(c) Mobilization-type and T/O modified buildings—sash, doors, trim, and exposed metal.

(d) Permanent buildings and facilities—surfaces other than wood and metal, such as concrete and masonry, as necessary.

(e) Mobilization-type and T/O modified buildings of the following utilization: administration buildings, chapels, schools, guest houses,

Red Cross buildings, service clubs, officers' clubs, staff and special staff buildings, telephone buildings, post office and bank buildings, Army exchanges, and theater buildings.

(f) Other buildings, including mobilization-type and T/O modified buildings not listed in (e) above if and when the funds are available after provisions for painting and repainting of the higher priority buildings have been made.

(2) *Inactive installations.* Painting and repainting of permanent, theater-of-operation and mobilization-type troop housing and appurtenant facilities not scheduled for active military use, but held in reserve to meet the requirements of the Universal Military Training Program, the Organized Reserve Corps, or the National Guard, will be limited to sash, doors, and trim.

(3) *Installations planned for disposal.* Painting and repainting of any buildings and facilities at installations, or portion thereof, scheduled by the War Department for disposal will be limited to sash, doors, and trim, and only to the extent economically justified and necessary to keep buildings and facilities in a serviceable condition during planned period of utilization and disposal.

d. **INTERIOR PAINTING.** (1) Only buildings scheduled to be retained for active use by the military establishment will receive painting or repainting. Painting and repainting interior of buildings will be authorized upon sufficient justification and the individual merits of each particular case. The interior of warehouses and storehouses will not be painted. Buildings not lined on the interior (that is, with exposed studs, floor beams, and roof framing) will not be painted prior to lining without specific authorization. Plaster, gypsum board, or some similar noninflammable material will be used for interior lining.

(a) *Kitchens, mess halls, day rooms, and barracks.* When white-washing of unlined kitchens, kitchen storerooms, mess halls, day rooms, and barracks of mobilization and theater-of-operation type buildings is considered desirable and approved by the commanding officer of the installation, the post engineer will supply the organization with the materials and equipment in accordance with current instructions of the Chief of Engineers—oil paint may be used for wood surfaces which will be exposed if and

when lined. Repairs and utilities funds may be used for materials and equipment, but will not be used for labor.

(b) *Army exchanges.* Materials and labor for interior painting in Army exchanges will be paid for from nonappropriated funds; War Department funds will not be used for such projects.

(2) *Active installations.* Interior painting and repainting in permanent buildings for troop housing and appurtenant facilities at installations, or portions thereof, which are approved by the War Department for retention as a part of the active permanent military establishment will be progressively brought up to maximum economical peacetime standards. Interior painting of lined surfaces only is authorized in the following mobilization and theater-of-operation type buildings scheduled to be retained: hospital buildings used by patients; bakeries; cold storage rooms; service clubs; guest houses; exchanges; induction buildings; administration buildings; chapels, schools, and class rooms; weather forecasting rooms at base weather stations; air transport command passenger terminals; and Chemical Corps and Ordnance Department plants where necessary to reduce hazards resulting from handling and processing explosives and explosive and toxic gases.

(3) *Day rooms and barracks.* When painting lined day rooms and barracks of mobilization and theater-of-operation type buildings is considered desirable and approved by the commanding officer of the installation, it will be accomplished in accordance with repairs and utilities painting manual, TM 5-618 (when published), and other current instructions; the post engineer will supply the organizations with materials (oil paint for exposed wood work and resin-emulsion paint for lined surfaces) and equipment. Repairs and utilities funds may be used for material and equipment, but will not be used for labor.

(4) *Inactive installations and installations planned for disposal.* (a) Interior painting and repainting of any buildings and facilities (either lined or unlined) at installations or portions thereof not scheduled for active military use, but either held in reserve to meet the requirements of the Universal Military Training Program, the Organized Reserve Corps or the National Guard, or scheduled by the War De-

partment for disposal is not contemplated and is not authorized.

(b) *Inspection and records.* Periodic inspection should be made of painted surfaces and conditions noted. Also, record should be kept of the type of paint used on previous coating in order that the proper type of paint may be used in repainting. The colors and types of exterior and interior paints will be the same as prescribed by the Chief of Engineers for hospital painting program, color cards of which were furnished each Army area.

e. *APPLICATION.* Surfaces will be prepared and painting will be performed in conformity with TM 5-618, Painting, Repairs and Utilities Manual, Part VI, Chapter III, Painting (when published), and in accordance with current instructions of the Chief of Engineers.

2.17. Floor Repairs and Covering

a. *GENERAL.* Frequently, coverings and topings are the cheapest and fastest means of floor repair. As substitutes for reflooring and extensive replacement, their use results in substantial savings in critical materials. A general program of improving existing floors should not be initiated unless specifically directed by OCE. Only floors definitely in need of repair should be improved, and then only when the planned future use of the building warrants it. Linoleum or other floor covering should be installed only after floors become unsanitary or dangerous. Floor covering should not be laid over wood floors less than 4 to 5 months old because warpage and shrinkage of the floor during this period will damage even floor covering installed over a suitable underlay. Ordinarily, wood floors should not constitute a hazard until after 9- to 12-months' use. Before installing floor covering, consideration should be given to the type of occupancy involved and to the wide variation between War Department construction standards and normal civilian standards. Covering hardwood or high-quality pine flooring is not contemplated. Appropriate corrective measures developed for areas and occupancies most often requiring work of this nature are outlined herein. For installation details, specifications, etc., see TM 5-616 (when published).

b. *HOSPITALS.* (1) Floor covering may be authorized in the following areas and under the conditions stated:

(a) All wards, clinics, infirmaries, surgery,

X-ray, recreation buildings, and other buildings which are habitually used by patients and are finished with flat-grain pine, fir, or other low-grade wood flooring or concrete.

(b) Corridors (inclosed connecting walkways) and administration buildings.

(2) (a) Over wood construction, floor coverings should conform to Federal Specification LLL-F-471, amended 26 June 1943, grades A, B, or C, in roll form, or to 1/8-inch burlap backed linoleum conforming to Federal Specifications LLL-L-351a, battleship or LLL-L-367, Jasper and marbelized. Use of grade A material is considered justified only in hospitals of the larger and more permanent type. To encourage adequate competition and secure a reasonable price, quotations in such cases must be obtained on grades B and C as well. In hospitals of less permanent type, use of grade A covering should be avoided. In southern portions of the continental United States, asphalt tile has given good service in many cases when properly applied over wood construction of suitable design and may be used under similar circumstances if specifically approved by the service command. Floor coverings over wood construction will be installed over a plywood underlay.

(b) Existing concrete floors on grade in the areas indicated in (1) above, will be covered with 1/8-inch asphalt tile, B group, conforming to Federal Specification SS-T-306. Concrete floors above grade may be covered with asphalt tile or linoleum of the appropriate type and grade. Installation and preparation of the undersurface will be in accordance with manufacturer's directions.

(3) To secure the benefits of competition, bids for floor-covering projects will be obtained and estimates made on the following:

(a) Material purchased by post or army area directly from manufacturer.

(b) Material purchased by post from dealer.

(c) Installation of delivered material by post labor.

(d) Installation of delivered material by contract.

(e) Material and installation by contract.

(4) Several of the lower grades of plywood are suitable for use as underlay in floor-covering projects. Instructions will be furnished from time to time on the most available grades and similar information.

c. *HOSPITAL AND TROOP MESS HALLS.* Concrete

laid in accordance with TM 5-615 (when published) will withstand frequent wet scrubbing and resist wear and tear better than linoleum or other floor covering. Mess halls and similar buildings should be refloored as described in TM 5-615 with 1½-inch thick concrete topping if the existing wood-floor framing is sufficient.

d. GENERAL ADMINISTRATION BUILDINGS (ASPHALT COMPOSITION). Applying Mastipave, Armoflor, or similar asphalt composition material laid in asphalt over a rough sanded wood floor results in a reasonably economical and satisfactory repair for administration and similar special buildings, except those in hospital areas. Indentation is a problem with this material but its ability to adapt itself to irregularities in the under floor compensates for this disadvantage. Use of higher type floor covering in these buildings normally is not authorized.

e. BARRACKS AND DAY ROOMS. When floors in barracks, day rooms, and similar buildings are in such poor condition that repairs are imperative, inexpensive floor-covering materials, such as Cantonment Flooring, Rubberlike, smooth-surface asphalt roll roofing, etc., may be used to good advantage. In these buildings, underlay or extensive preparation of the existing floor is not necessary. There is no specific designation of buildings in which these materials can be used. Requests will be considered individually.

f. WAREHOUSES AND SHOPS. For materials and methods used to recondition defective concrete floors in warehouses, shops, and similar buildings, see TM 5-615.

2.18. Dustproofing Concrete Floors

If dusting of concrete floors is an immediate problem, see discussion of dustproofing materials and methods of application in TM 5-615.

2.19. Arms Racks

As a temporary expedient, post engineers may construct improvised small-arm security facilities by placing hinges, hasps, and a lock on the chest in which arms were shipped; making an A-frame out of 2 x 4's, with steel bars locking above and below the trigger guards; or building a wall frame with the same type locking bars as the A-frame. The work will be done only upon proper certification that prefabricated arms racks had been requisitioned from the Ordnance Department depot but were not

available, that all other means of protecting small arms have been exhausted, and that the improvised facilities are needed. Repairs and utilities funds will be used.

2.20. Insect Screens

Window and door screening will be provided in the following buildings in all temperature zones: barracks, officers' quarters, administrative buildings, recreation buildings, mess halls, and latrines. Unless more economical and practical methods of screening are devised locally, TM 5-616 should be followed. Because of material limitations, the quality of galvanized screen cloth used in wartime Army installations is generally lower than that obtaining under prewar standards; therefore, proper maintenance of screens is extremely important. Screens must not be left in place until replacement of the cloth is required; they will be taken down and repaired whenever necessary.

a. INSTALLATION, MAINTENANCE, AND WINTER STORAGE. Materials and methods for installation, maintenance, repair, and storage of screens are set forth in TM 5-616. Recommendations on storage and painting also apply to galvanized screens on prewar buildings; however, in those cases painting probably will be required less frequently. Where insects are no problem in the winter, removable screens should be taken down and stored during the winter months if they can be stored in the building from which removed. When taken down, screens and the window frames from which they are taken should be numbered identically.

b. STAND-BY STORAGE. When a post is placed in excess, surplus, or stand-by status, screens will be removed immediately from all windows and placed inside the building, against the wall, and under the windows from which they were taken. When the building is reoccupied, troops moving in will replace the screens.

c. FIRE PREVENTION. To comply with fire-prevention requirements, all screen doors on openings through which out-going traffic must pass will be hung to swing in the direction of exit travel. *All reference to in-swinging screen doors on drawings and in specifications should be disregarded.* Drawing No. 700-3145 has been issued to show details of several types of combination screen and solid-panel doors for use in new construction and repair work. They are designed to meet both sanitary and safety requirements by

5.66. Warehouse Heating

a. WHEN AUTHORIZED. Warehouse heating will be authorized where required by operations performed in them or to protect perishable material against freezing. However, before heating facilities are requested between fire walls in any warehouse section, the using service will submit evidence to the post engineer to show that operations in each section cannot be performed in other sections which are already heated or for which heating is proposed.

b. DEGREE OF HEATING. Although the percentage of warehouse space which may be heated is not limited, every effort will be made to follow the recommendations below so heated areas will be at a minimum. Maximum temperatures are as follows:

(1) 70° F. for all office space, toilet rooms, and areas where many employees work seated or standing on jobs involving little exercise.

(2) 55° F. for sections where many employees work entirely inside, standing and exercising moderately; such work includes sorting, collecting into and from bins, etc.

(3) 40° F. for sections where employees do work involving considerable exercise, such as packing, crating, and stacking, or where heat is required to protect material from freezing.

(4) No heating will be permitted in sections which do not contain material requiring protection from freezing, and where the only operations are placing and withdrawing stored goods.

c. JUSTIFICATION. Requests for heating facilities will include complete justification as follows:

(1) Complete outline of present and proposed heating facilities.

(2) Description of operations performed in all warehouse space for which additional heating facilities are requested.

(3) Maximum, minimum, and average outside temperature for winter season for past 5 years taken from Weather Bureau records.

(4) Floor-plan sketch of all warehouse facilities showing areas and number of employees as follows:

(a) Number working seated with minimum exercise, such as office work, or standing with little exercise, such as filing.

(b) Number standing with moderate exercise, such as sorting or working at assembly tables, bins, etc.

(c) Number standing with considerable exercise, such as packing, crating, boxing, stacking, and loading.

(d) Storage areas where employees are present only occasionally.

d. SCREENING OF REQUESTS. Requests for additional heating will be screened with extreme caution, and no requests will be considered if other means can be used. Questions on proper use of warehouse space at posts, camps, and stations will be referred to the appropriate service command for review and recommendation by the technical service representative; those involving class IV installations will be referred to the office of the chief of technical service for review and recommendation.

5.67. Manufacturing Plants

At industrial sections of Government-owned and operated Chemical Warfare and Ordnance Department armories, arsenals, and proving grounds, maintenance, repair, and operation of gas generating plants, inside gas-distribution systems (except those used for heating, cooking and lighting), and boiler-plant and steam-distribution systems are an operating service responsibility. Maintenance, repair, and operation of outside gas-distributing systems at these installations are a repairs and utilities responsibility. Mechanical engineers in OCE and in the service command engineer's office will be available on request to assist in problems of operation and maintenance. For a list of facilities to which this policy applies, see paragraph 1.9.

Section V. REFRIGERATION

5.68. Refrigerated Warehouse Facilities

a. STORAGE SPACE. The Office of The Quartermaster General has set the following standards for an approximate upper limit. They may be reduced if local conditions warrant.

(1) *Stations under 3,000-man troop strength.*

(a) Frozen-food storage space (10° F.)—one prefabricated frozen-food storage refrigerator, type KE-25-27, 275-square-foot.*

(b) Cooler storage space (30° F. and over)—0.4 square foot per man.

(2) *Stations of 3,000- to 5,000-man troop strength.* (a) Frozen-food storage space (10° F.)—one prefabricated frozen-food storage refrigerator, type KE-25-28, 550-square foot.*

(b) Cooler storage space (30° F. and over)—0.4 square foot per man.

(3) *Stations over 5,000 man troop strength.*

(a) Frozen-food storage space (10° F.)—0.1 square foot per man.

(b) Cooler storage space (30° F. and over)—0.3 square foot per man.

b. HOSPITALS. The above policy does not apply to general hospitals or station hospitals not served by post quartermaster facilities. The post engineer will correct essential refrigerated-storage deficiencies where necessary to meet the requirements of the individual hospital.

c. STORAGE-ROOM TEMPERATURE. Frozen-food storage rooms will be used only for storing food received frozen; they will not be used to freeze food. Temperatures in these spaces will not exceed an average of 10° F. Cooler storage rooms will not operate below 30° F.

d. BRINE-SPRAY UNITS IN COLD-STORAGE ROOMS. Only sodium chloride brine solution will be permitted in brine-spray units serving cold storage rooms for perishable food. Inhibitors for corrosion and rust control are harmful to food products and their use in brine-spray units delivering air to food-storage spaces will not be permitted. Rust and corrosion of metal surfaces in these units will be controlled where necessary by applying a suitable protective paint.

*Applies only to stations served from market center so distant that frozen food must be picked up 5 days or more in advance of issue.

e. MEAT HOOK OVERHEAD MEAT TRACKS, AND TRACK SCALES. Trolley-type meat hooks which become a fixed part of the cold-storage warehouse will be provided by the post engineer. One trolley-type meat hook per foot of overhead meat track in cold-storage rooms is adequate. Plain, removable, hookover type meat hooks are quartermaster equipment and will be provided by the post quartermaster (supply officer). Cantilever track scales for cold-storage plants are generally used only in accepting meat from the vendor. One scale on the receiving track will suffice inasmuch as the tagged weights are generally used for receiving and issue of shipments obtained through quartermaster market centers. Local purchase of meat hooks, meat track, and track scales will be made only when they are not available from unused post facilities. Meat tracks will not be used in frozen-food storage spaces; all frozen food will be piled on floor dunnage.

f. SHELVES. Shelves will not be used to conserve floor area in frozen-food and cooler storage spaces.

g. DIRECTIVES ON PERISHABLE FOOD. The following publications of the Office of The Quartermaster General and The Adjutant General pertaining to warehousing of perishable subsistence will be used as a guide: TM 10-610 and SB 10-187.

5.69. Gas Masks and Canisters Requisitions

*a. Requisitions for special purpose gas masks and canisters for repairs and utilities purposes from class I and II installations will be submitted to the appropriate army commander for approval; requisitions from class III installations will be submitted to the appropriate major army air force command, designated by the Commanding General, Army Air Forces as responsible for repairs and utilities, for approval. Approved requisitions for the following listed special-purpose gas masks and canisters will be forwarded for supply direct to the appropriate Chemical Corps depot listed in *b* below. Requisitions involving *exceptional* issues of canisters and gas masks will be submitted to the appropriate depot through the Office Chief of Chemical Corps.*

Gas masks

Mask, gas, special, M2A2—Acid Vapor MI-III AI

Mask, gas, special, M2A2—All-Purpose MI-III AI

Mask, gas, special, M2A2—Ammonia M2-IV AI

Mask, gas, special, M2A2—HCNM2—IV AI

Mask, gas, special, M2A2—Oil Vapor MI-III AI

Canisters

Canister, Acid Vapor, MI

Canister, All-Purpose, MI

Canister, Ammonia, M2

Canister, HCN, M2

Canister, Oil Vapor, MI

b. Approved requisitions for items listed in a above will be forwarded direct to the appropriate Chemical Corps depot in accordance with the following:

Item

Supply depot

Gas Masks for use in
States listed below:

Maine
Vermont
New Hampshire
Massachusetts
Connecticut
Rhode Island
New York
New Jersey
Delaware
Kentucky
West Virginia
Maryland
Virginia
Tennessee
North Carolina
South Carolina
Mississippi
Alabama
Pennsylvania
Ohio
Indiana
Georgia
Florida

The Commanding
Officer, Eastern
Chemical Depot,
Edgewood, Mary-
land.

Item

Gas Masks for use in
States listed below:

Michigan
Illinois
Wisconsin
Minnesota
Iowa
Missouri
North Dakota
South Dakota
Nebraska
Kansas
Wyoming
Colorado
Arkansas
Louisiana
Oklahoma
New Mexico
Texas
Montana
Idaho
Washington
Oregon
Utah
Arizona
Nevada
California

Supply depot

Chemical Supply Offi-
cer, Utah General
Depot, U. S. Army,
Ogden, Utah.

Canisters for use in
all army areas and
appropriate major
army air forces
commands.

The Commanding
Officer, Gulf Chem-
ical Depot, Hunts-
ville, Alabama.

c. Special purpose industrial masks other than those listed in a above, and respirators, required for repairs and utilities purposes and approved by the army commander or the appropriate army air force command designated by the Commanding General, Army Air Forces, as responsible for repairs and utilities, may be purchased direct from ESA, Project 300 funds, available locally. Such special purpose items should be procured direct in accordance with the general schedule of supplies "Special Wearing Apparel" (Grade 37, Supplement No. 5), Procurement Division, Treasury Department. If not listed therein, such items may be pro-

cured direct from any source approved by the army commander or appropriate major army air force command designated by the Commanding General, Army Air Forces, as responsible for repairs and utilities, and should not be requisitioned on the Chemical Corps.

d. Instructions contained in TM 3-205, instructions carried on the exterior of the canisters, and information derived from the local Chemical Corps officer, will be observed in the use of gas masks and canisters.

5.70. Supply of Refrigerants

The army area engineer will submit (insufficient time to be received by the 20th of the month) to OCE, Attn: SPEUF, monthly letter request for the required amount of freon-12 to be shipped the following month. Negative requests will be submitted if no shipments are required. Requests will indicate quantity and size of cylinders desired. Requests will be modified by OCE on the basis of available cylinders. OCE will request contractor to ship the approved amount of freon-12 by freight to a central destination and will advise the army commander to issue a confirming delivery order. Posts will be supplied required amounts of freon-12 for repairs and utilities purposes by requisition from the army area stock. Government-owned freon-12 cylinders, except those which are used for service, are shipped by freight collect to Kinetic Chemicals, Incorporated, Carney's Point, New Jersey, immediately after they are emptied. Freon-12 for other than repairs and utilities purposes, and other refrigerants such as ammonia, sulfur dioxide, and methyl chloride, will be procured in accordance with SB 5-49. (See par. 1.61.) Local purchase of refrigerant cylinders is not authorized.

5.71. Accountability for Government-owned Freon Gas Cylinders

Filled Government-owned freon cylinders received at an army area engineer warehouse from the manufacturer will be accounted for and picked up on the warehouse stock record. Cylinders will be shipped to individual posts on a War Department shipping document which will serve as a credit voucher to the warehouse

stock account. Cylinders received by the post engineer will be picked up on the stock record cards in accordance with TM 5-601. The army area War Department shipping document will be the debit voucher to this account. Empty cylinders will be shipped collect freight to Kinetic Chemicals, Inc., on a War Department shipping document, a copy of which will act as a credit voucher to the post engineer's stock account. Two copies of this document will be forwarded, one attached to the requisition to army area for additional refrigerant, the other to the District Engineer, U. S. Engineer Office, Military Supply Division, 1400 Penn. Mutual Building, Philadelphia, Pennsylvania. Attention of Property Officer. No attempt will be made to account for cylinders by serial number.

5.72. Supply of Mechanical Refrigerators

a. REQUISITION. Mechanical refrigerators required for repairs and utilities work and listed in Equipment Manual for Area and Post Engineers will be furnished to posts, camps, and stations on requisition. As the need arises, requisitions for initial requirements will be forwarded through appropriate army area channels in accordance with existing regulations. Initial requirements or complete replacements for AAF control depots will be furnished without reimbursement.

b. INFORMATION REQUIRED. Requisitions for refrigerators purchased centrally will include the following:

(1) For refrigerators to supplement existing capacity in mess halls for warehouses:

(a) Number of persons being served.

(b) Type and plan number of building containing the facility.

(c) Cubic contents of existing refrigerated space.

(d) Additional refrigerated space required.

(2) For frozen-food refrigerators (10° F.) in hospital, consolidated mess, or warehouse:

(a) Name and location of market center which serves post.

(b) Distance from market center to post.

(c) Present schedule of deliveries from market centers.

(d) Items of subsistence delivered frozen.

(e) Time between delivery from market and issue.

(f) Frozen-food storage space (10° F.) now available.

(g) Approval of army area or air force quartermaster or supply officer.

5.73. Manufacturing Plants

Responsibilities for operating refrigeration and ice plants at industrial sections of Government-owned and operated Chemical Corps and Ordnance Department armories, arsenals, and proving grounds are as indicated below: OS denotes

operating service and RU denotes repairs and utilities. For a list of facilities to which this policy applies, see paragraph 1.9.

<i>Operation</i>	<i>Responsibility</i>
Industrial refrigeration*-----	OS
General post-use plants-----	RU
Sale of ice-----	OS
Nonindustrial refrigeration--	RU
Compressed-air system-----	OS

*Refrigeration engineers in OCE and army area engineers in each army area are available to assist in problems of operation and maintenance.

(2) Nonchlorinated water from municipal or privately owned sources.

(3) Chlorinated water from municipal or privately owned systems where sanitary, physical or operating defects or other special hazards are known to exist or where bacteriological examinations show that satisfactory quality cannot be obtained without rechlorination by the post.

b. EXCEPTIONS. The foregoing is not mandatory if—

(1) Following chlorination, the water is stored for long periods in properly protected distribution reservoirs.

(2) Iron, manganese, or other chlorine-consuming compounds make it impractical to maintain a chlorine residual of 0.4 ppm. In such cases additional treatment may be required to produce water of acceptable bacteriological quality.

c. USE OF AMMONIA. If use of chlorine alone results in objectionable tastes and odors due to foreign matter or to the chlorine itself, ammonia may be used with the chlorine. This use will be restricted to locations where the tastes and odors are highly objectionable.

5.84. Chlorination of Sewage

Except in emergencies or where required for satisfactory sanitation within a military reservation, specific approval by army area will be required for chlorination of sewage plant effluents. Approval will be recommended only where chlorination is clearly needed to protect public health or, in limited instances, where required to control nuisance conditions.

5.85. Liquid Chlorine

a. INITIAL SUPPLY OF CYLINDERS. (1) Each class I, II, and III installation at which the repairs and utilities functions are a command responsibility of an army commander, the Commanding General of the Military District of Washington, or of the Commanding General, Army Air Forces, will be assigned Government-owned (generally 150-pound capacity) chlorine cylinders on the basis of normal chlorine requirements, number of chlorinators, and shipping time for refilling. Privately owned cylin-

ders, except 1-ton containers, will not be used and will be returned to owners when empty.

(2) Additional cylinders for changed requirements and emergencies for class I and II installations will be requisitioned from the responsible army commander or the Commanding General of the Military District of Washington. Cylinders for class III installations will be requisitioned through AAF supply channels as designated by the Commanding General, Army Air Forces.

(3) Cylinders excess to an installation will be transferred to the responsible army commander, the Commanding General of the Military District of Washington, or in the case of class III installations, be reported in accordance with instructions issued by the Commanding General, Army Air Forces.

(4) All Government-owned cylinders will be carried on the property records of the post engineer by size only. Serial numbers will not be listed on records, bills of lading, purchase or delivery orders.

(5) Except in emergencies, requisitions for chlorine cylinders from installations at which repairs and utilities functions are not a responsibility of an army commander, the Commanding General of the Military District of Washington, or the Commanding General, Army Air Forces, will be forwarded to Office of the Chief of Engineers for approval.

b. RESERVE SUPPLY OF CYLINDERS. Each army area, the Military District of Washington, and designated AAF supply depot will maintain a limited stock of cylinders for transfer to installations in cases of changed requirements and emergencies.

c. PROCUREMENT OF CHLORINE GAS. (1) Each army area and the Military District of Washington will maintain indefinite quantity contract or contracts for the filling of Government-owned chlorine cylinders within the geographical limits of the army area, effective on issuance of purchase orders by class I, II, and III installations. Liquid chlorine for repairs and utilities purposes will be purchased only under such contracts.

(2) Indefinite quantity contracts for refill of cylinders will require contractors to—

(a) Fill Government-owned cylinders and mark them for return to installations in accordance with U. S. Army Specification No. 4-1A.

(b) Inspect and test cylinders as required by I. C. C. regulations.

(c) Inspect and service cylinder valves.

(d) Repaint cylinders as necessary for proper protection.

(e) Be responsible for cylinders consigned or loaned to him until delivered to common carrier or to consignee in event common carrier is not used for return.

(f) Render monthly report to army commander, with copy to Office of the Chief of Engineers, showing cylinders consigned to him as shown by B/L and delivery tickets, cylinders received, cylinders delivered to common carrier or other for return to installations, weight of chlorine sold and balance of cylinders on hand.

(g) Submit itemized invoice for chlorine and other services in accordance with contract provisions promptly to installations for each purchase order.

(3) Each purchase order will cite the contract number, number of cylinders shipped for refill, funds available, and payment office. All shipments of cylinders will be on Government B/L.

(4) Army commanders and the Commanding General of the Military District of Washington are authorized to loan a limited number of cylinders and spare valves to contractors to eliminate delay in servicing and maintaining cylinders and to make up for cylinders delayed in transit.

5.86. Calcium Hypochlorite

Rescinded.

5.87. Submission of Water Samples for Chemical Analyses

When field analyses are impractical, complete chemical analyses of post water supply may be obtained by submitting samples to the Geological Survey. The Water Resources Branch, U. S. Geological Survey, Washington, D. C., will supply sample bottles, shipping containers, and instructions on request. Whenever possi-

ble, field tests for pH and dissolved oxygen and carbon dioxide should be made when samples are taken, and the data obtained sent with the samples to the Geological Survey.

5.88. Scale and Corrosion in Potable-water Supply Systems

Threshold conditioning will be used to control scale and/or corrosion in potable-water supplies, particularly in hot-water systems, in accordance with established procedures. Technical problems which arise will be referred to the army area engineer who has competent personnel available to recommend methods of treatment and chemicals to be used. Contracts for potable-water treatment by private industrial or commercial firms are not authorized.

5.89. Safeguarding Port Water Supplies

The following precautions for reducing health hazards through pollution of drinking-water sources will apply to all War Department installations at pier, warehouse, and dock facilities, and to vessels moored to waterfront facilities under War Department jurisdiction.

a. **AT PIERS.** No cross connections, siamese or others, will exist between shore drinking-water supply and nonpotable-water supply systems for fire fighting or other purposes.

b. **VESSELS WITH POWER.** No cross connections will exist between shore drinking-water supply and nonpotable- or unsafe-water supply systems on vessels moored to waterfront facilities when such vessels have power to operate fire or other pumps.

c. **VESSELS WITHOUT POWER.** Whenever a vessel moored to a waterfront facility is without power to operate its fire pumps, a water supply for fire protection will be made immediately available by taking the following measures:

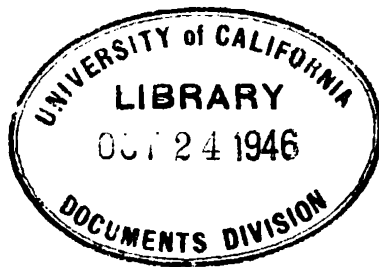
(1) Water from the shore drinking-water system may be brought aboard for fire protection by separate hose lines or other means, provided there is no connection between the shore drinking-water system and any other water source.

(2) If the vessel has no power to operate its pumps, a connection from the shore drinking-water system to the vessel's fire and sanitary-flushing systems may be made with a fixed pipe

or hose line, provided that satisfactory backflow prevention devices are installed between the vessel and shore systems at individual outlets and that such installations meet the minimum requirements of local health codes or regulations or of agreements made with local health authorities for this specific wartime use.

(3) If the connections described in (2) above, are not feasible, hose lines may be led aboard and necessary adapters and fittings furnished

for making a physical connection between the shore drinking-water system and the vessel's fire system. However, no actual connection will be made for fire fighting until an alarm is sounded. A man on watch will be assigned to complete all connections and open necessary valves when the alarm sounds. He will break the connections as soon as the alarm ends. He will be responsible for notifying the local health officer and local



TM 5-600
C 5

TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES

CHANGES
No. 5

US WAR DEPARTMENT
Washington 25, D. C., 19 September 1946

TM 5-600, 6 November 1945, is changed as follows:

Remove pages 157 and 158 and insert revised pages 157 and 158, and add new pages 158A through 158C.

[AG 300.7 (20 Aug 46)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

DWIGHT D. EISENHOWER
Chief of Staff

DISTRIBUTION:

AAF (2); AGF (5); T (Eng) (10); Dept (Eng) (5); Base Comd (10); Def Comd (Eng) (10); HD (Eng) (5); Tech Sv (2) except OCE (75); AAF Comds (Air Instls) (ZI) (10); AAF Comds (Eng) (Overseas) (2); AMA (Air Instls) (5); FC (Post Eng) (5); BU (Eng) (Overseas) (2); Class III Instls (Eng) (5); PE (Eng) (5); Ars (Post Eng) (5); Dep (Eng) (5); Dist 5 (2); Div Eng (10); GH (Post Eng) (5); RH (Eng) (5); CH (Post Eng) (5); A (2); A (Eng, R&U) (10); D (Eng) (2); Bn (Eng) (Overseas) (2); AF (Air Instls) (ZI) (5); AF (Eng) (Overseas) (2).

For explanation of distribution formula, see FM 21-6.

Section VIII. OPERATIONS

6.62. Training

a. BY CHIEF OF ENGINEERS. The Chief of Engineers will prepare manuals on fire-fighting technique and on inspection and maintenance of equipment for publication by the War Department. Intercommand training conferences to develop and promote improved and uniform methods will be arranged as needed.

b. BY ARMY COMMANDER. Each army commander will hold centralized training conferences and schools in all phases of fire prevention and protection to develop and promote improved uniform methods throughout the army area. Army area personnel will also help organize individual training courses at posts, camps, and stations.

c. BY POST FIRE DEPARTMENT PERSONNEL. A continuous fire-prevention and fire-protection training program will be established for fire department personnel at each post. Auxiliary fire personnel and other post personnel will be trained as needed. Arrangements will be made for periodic demonstrations and instructions in the use of portable hand fire extinguishers located throughout War Department buildings. This can be done effectively by discharging certain types of extinguishers before occupants of the buildings at the time the extinguisher is ready for recharging. Appropriate placards distributed under the Army Conservation Program and indicating the type, use, and operation of common extinguishers will be conspicuously posted so long as available. See paragraph 6.43 on conservation of carbon tetrachloride in training operations.

6.62.1. Fire Department

a. SCOPE. (1) The criteria established herein set forth the requirements for determining the number of motorized fire pumping apparatus required for fire protection and the number of fire department personnel that will be on duty at all times at War Department owned and operated installations in the continental United States. Where local conditions or circumstances

make the standards prescribed below in this section inappropriate, specific exceptions may be granted by the army commanders, the Chief of Ordnance, Chief of Chemical Corps, Chief of Transportation, or commanding generals of major Army Air Forces commands as designated by the Commanding General, Army Air Forces, having staff supervision and command responsibility for fire prevention and protection at respective installations.

(2) These criteria do not pertain to motorized fire apparatus and personnel engaged primarily in aircraft crash rescue and aircraft fire fighting.

b. MOTORIZED FIRE APPARATUS. (1) *General.* These criteria will constitute the basis for determining the number of motorized firepumping apparatus required for the provision of adequate fire protection.

(a) The authorization of motorized fire pumping apparatus at an installation located within the corporate limits of municipalities or other governmental subdivisions having motorized fire pumping apparatus and an organized fire department available for immediate response to the installation will be made only upon specific approval as indicated in *a*(1) above.

(b) At installations beyond the corporate limits of municipalities, full consideration will be given to the protection available from municipal or other fire departments. The number of pieces of motorized fire pumping apparatus dependably available from such sources within the running distances specified in (2) below, for which mutual provisions can be made to assure reliable response, will be considered to reduce the requirements established herein. However, at least one piece of motorized fire pumping apparatus will be maintained at installations where such outside assistance is available from volunteer fire department organizations.

(2) Distance distribution of motorized fire pumping apparatus with respect to areas protected.

(a) The following distances, measured over the most probable route of response, normally will not be exceeded between fire stations and

the most remote portion of a normally concentrated area, except as specified in the case of hospitals:

1. Barracks and living quarters_ 5 miles
2. Warehouses and technical buildings _____ 2 miles
3. Hospitals, measured to center of area _____ $\frac{3}{4}$ mile

(b) Isolated or scattered buildings will not be included in determining distance distribution of motorized fire pumping apparatus.

(3) Allowance of motorized fire pumping apparatus established for the following installations:

(a) *General hospitals.*

<i>No. of beds</i>	<i>No. of pumping apparatus</i>
Under 1,000 beds_____	1 or 2
Over 1,000 beds_____	2

(b) *Manufacturing, processing, and storage installations.*

<i>Total square footage of floor and ground area utilized for manufacturing, processing, and storage</i>	<i>No. of pumping apparatus</i>
Under 1,000,000_____	1
1,000,000 to 4,000,000_____	2
4,000,000 to 8,000,000_____	3
8,000,000 and over_____	4

If 50 percent of the total manufacturing, processing, and storage area is sprinklered, the number of motorized fire pumping apparatus will be reduced by one, except if sprinklered area is between 500,000 to 2,000,000 square feet there will be a minimum of one and if sprinklered area exceeds 2,000,000 square feet there will be a minimum of two motorized fire pumping apparatus. The minimum number of motorized fire pumping apparatus will not be less than indicated in the above table for areas corresponding to the remaining unsprinklered areas. At installations with only one motorized fire pumping apparatus, an additional fully equipped reserve motorized fire pumping apparatus will be provided.

(c) *Posts, camps, and stations.*

1. A minimum of one at all installations, except class III, with population be-

tween 500 and 6,000 and a minimum of two motorized fire pumping apparatus at installations with a population exceeding 6,000 and with the exceptions noted in (3) (b) above. Additional motorized fire pumping apparatus to comply with the distance distribution specifications outlined in (2) above and to provide an aggregate pumping capacity equal to two-thirds of the maximum fire flow demand as specified in War Department directives.

2. A minimum of one motorized fire pumping apparatus at class III installations with normally developed population capacity between 500 and 2,500; a minimum of two at installations between 2,500 and 5,000 population capacity; and a minimum of three at installations exceeding 5,000 population capacity.

3. *Station hospitals.* One additional motorized fire pumping apparatus for exclusive protection of each individual hospital area of 1,000 beds or more at posts with three or more motorized fire pumping apparatus.

(4) *Brush fire trucks.* Standard Class 300 and Class 325 brush fire trucks, as included in the nomenclature lists, will be authorized for issue to installations which involve heavily forested or brush-burdened areas, or where unusual fire hazards exist because of bombing or artillery range activities. This type of fire truck may also be authorized in lieu of standard motorized fire pumping apparatus at small posts or isolated stations where water supply for fire protection purposes may be limited and where dependence must be placed on small hose lines and greater water carrying capacity. Requests for the assignment, and approval for the issue of brush fire trucks will be made on the basis of complete justification according to local conditions. Allotments of personnel for these trucks are authorized only when the trucks are authorized in lieu of standard motorized fire

pumping apparatus or where exceptional conditions warrant special authority as indicated in *a* (1) above.

(5) *Auxiliary pumping equipment.* Trailer-mounted fire pumping units and skid-mounted fire pumps are listed in standard nomenclature lists and are available for issue. These are supplied to meet special conditions such as auxiliary protection of piers and wharfs, isolated installations which do not justify the assignment of motorized fire pumping apparatus, and locations inaccessible to motorized fire apparatus.

c. FIRE DEPARTMENT PERSONNEL. The criteria set forth below do not establish the total number of men in a fire department organization equipped with motorized fire pumping apparatus. For policy and regulations governing hours of work and compensation for this class of personnel, reference is made to appropriate regulations and directives.

(1) There will be one fire chief in charge of every organized fire department at military installations.

(2) The number of assistant chiefs, crew chiefs, and fire fighters to be on duty at all times for the successful operation of the various types of motorized fire pumping apparatus in service in an organized fire department at military installations is as follows:

(a) *Assistant chiefs.*

1. One assistant chief at posts, camps, and stations with three or more motorized fire pumping apparatus. At class III installations having less than three motorized fire pumping apparatus there will be a chief officer on duty at all times.

2. One assistant chief at manufacturing, processing, and storage installations.

(b) *Crew chiefs.* One crew chief for each motorized fire pumping apparatus.

(c) *Fire fighters.* Three fire fighters including driver for each motorized fire pumping apparatus in service.

(3) Additional fire fighters required to provide adequate inspection service at installations

with and without motorized fire pumping apparatus are as follows:

<i>Total square footage of floor and ground area utilized for manufacturing, processing, and storage</i>	<i>Without pumping apparatus</i>	<i>With pumping apparatus</i>
0 to 1,000,000-----	2	1
1,000,000 to 4,000,000-----	4	2
4,000,000 to 8,000,000-----	6	3
8,000,000 and over-----	8	4

Such personnel will normally be detailed to day-time duty only, except where operating conditions require 24-hour inspection service. At other than manufacturing, processing, and storage installations, inspection services will be performed by the personnel authorized in (1) and (2) above. The duties of this personnel will be to assist the fire chief in organizing and training fire brigades, inspecting the facility for fire hazards, maintaining fire extinguishers and equipment, and inspecting automatic sprinkler and alarm equipment.

(4) Additional personnel for fire alarm switchboard operation will not be authorized.

d. All instructions previously issued which are in conflict with the foregoing are hereby modified accordingly.

6.63. Inspections

a. BY CHIEF OF ENGINEERS. OCE fire prevention personnel will inspect representative installations often enough to determine the adequacy of the army area program.

b. BY ARMY COMMANDER. Army Area fire department instructor-inspectors and fire-truck and equipment inspectors will inspect all major installations, including class III installations quarterly, and all less important installations semiannually. Special installations will be inspected more often, at intervals set by the army commander. Army area fire-protection and equipment reports will not be forwarded to the Chief of Engineers except in the following unusual cases:

(1) Reports indicating need for change in policies, procedures, or criteria.

(2) Fire truck and equipment inspection reports indicating need for basic design changes, major repairs due to unusual circumstances or recurrent defects, or improvements in maintenance or operation affecting preventive maintenance.

(3) Reports for interpretation of basic policies, clearance with higher authority, or coordination with other agencies.

(4) Reports to accompany WD AGO Form 5-25, when they contain recommendations which are the basis of the project estimates or present evidence for justification.

(5) Reports indicating failure to comply with previous recommendations involving class III installations, for processing through the Chief of Engineers to Commanding General, AAF.

c. BY POST FIRE DEPARTMENT PERSONNEL. A continuous program of fire prevention and maintenance inspection of all buildings, processes, and fire equipment will be established at each post and will be carried out primarily by post fire department personnel. Its purpose will be—

(1) Control and abatement of fire hazards.

(2) Development of familiarity with buildings, processes, abnormal hazards, and other local conditions.

(3) Check-up of condition of fire equipment to keep it ready for instant use.

Inability to gain entrance to buildings because of the absence of the responsible personnel or because of the vacated status of the building will not be considered sufficient reason for the performance of only a cursory inspection. Particular effort will be made to inspect completely those buildings which are not occupied daily or at frequent intervals, and those buildings which are used for storage.

6.64. Fire-loss Records

a. BY CHIEF OF ENGINEERS. The Chief of Engineers will receive reports of fire damage submitted by all posts, camps, and stations in accordance with applicable regulations; will

review and analyze fire causes and distribute information and statistics covering fire-loss experience of the War Department; and will submit to higher authority an annual report of fire-loss experience together with any necessary reports.

b. BY ARMY COMMANDER. Army area engineers will review and record the fire-loss experience within their respective army areas, including class III installations; will initiate necessary corrective action indicated by fire-loss records; and will submit fire-loss reports when required.

c. BY POST FIRE DEPARTMENT PERSONNEL. Each post will keep a complete record of fire-loss experience, prepare reports of all fire damage for submission to higher authority in accordance with pertinent regulations, and compile such fire-loss statistics as the post commander may require.

6.65. Outside Aid

a. OUTSIDE FIRE DEPARTMENTS. Specific arrangements should be made for outside fire departments to assist post fire departments. Contracts may be made to provide such additional protection for a reasonable consideration. The Comptroller General has ruled that in view of the legal duty of a municipality to extinguish all fires within its limits, the Government is under no legal obligation to make payment to a city for fire-fighting services rendered in connection with a fire at a Government reservation located within the city limits unless there is a specific contractual obligation to that effect. (B-47142, 7 Feb. 45.) Arrangements for response of post fire departments to areas outside the military reservation may be made at the discretion of the post commander if the arrangements will not endanger post fire protection. Arrangements for response of post fire departments to areas outside the military reservation may be made at the discretion of the post commander if the arrangements will not endanger post fire protection.

b. **FORESTRY FIRE PROTECTION.** The post engineer should arrange for the assistance of appropriate Federal or State forestry services in problems involving control of fires in brush or forested areas of posts.

c. **WATER FRONT PROTECTION.** In areas under the water front jurisdiction of the Coast Guard but where protection of water front property is a function of the post fire department, the post engineer will arrange in advance for coordinating operations with the Coast Guard.

6.66. Utilities Services Assistance

The post engineer will arrange in advance for electric-, water-, and gas-utility personnel to respond to serious fires on receipt of a prearranged signal.

6.67. Inspection Criteria for Fire-fighting Equipment at AAF Installations

Fire-fighting equipment issued by the Chief of Engineers or army commanders to AAF installations will be inspected and maintained in accordance with established procedures and instructions covering this subject.

6.68. Flameproofing Decorations

Serious hazards result from the indiscriminate use of flammable decorating material, especially during holiday seasons. Combustible decorative materials, such as tinsel, streamers, scenery, and cotton batting, will be made flameproof. For information and methods of flameproofing, see TM 5-685 (when published). Under no circumstances will the use of open flames, including candles, for decorative schemes be permitted. Electrical devices, such as tree lighting sets, decorative lighting outfits, and extension strings, will be of types tested and approved by Underwriters' Laboratories. All holiday decorations will be taken down within 1 week following the holiday, and will be immediately removed from the premises and disposed of. Flammability of Christmas trees and similar vegetative decorations may be reduced by placing them in a stand having a reservoir of water.

6.69. Fire Precautions in Handling DDT

a. **COMPOSITION AND FORMS.** Insecticide LDT in its pure form is a white crystalline substance with a melting point of 107° to 108° C; it is

**TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES**

**CHANGES }
No. 6 }**

**DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 5 May 1948**

TM 5-600, 6 November 1945, is changed as follows:

Remove pages 85 and 86, and substitute revised pages 85 and 86, and add new page 86A.

[AG 300.7 (20 Apr 48)]

BY ORDER OF THE SECRETARY OF THE ARMY:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

OMAR N. BRADLEY
Chief of Staff, United States Army

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For explanation of distribution formula see TM 38-405.

conformance with the Directive for Wartime Construction and AR 100-80. All justification should clearly indicate why the requested work is essential to proper utilization of the barracks.

b. BREAD CABINETS. Bread and pastry can be fully protected by door and window screens properly installed and maintained. Therefore, installation of screened bread and pastry cabinets should not be approved.

4.17. Mess Tables and Stools

Rescinded.

4.18. Bedsteads and Cots

Rescinded.

4.19. Nonstandard Furniture

Rescinded.

Section III. PACKING AND CRATING (Superseded)

4.20. Definitions

a. The term *packing and crating* as used herein, and as implemented by TM 5-614, includes the selection or construction of shipping containers, assembling of items or packages therein, necessary blocking, bracing or cushioning, weatherproofing, exterior strapping, and marking of shipping containers in accordance with paragraph 4.21e for military, nonmilitary, and troop supply and equipment; and for authorized baggage, including any necessary protective wrapping and cushioning; blocking and bracing and provision of dunnage within railroad cars or motor vehicles when required for troop movement and in other instances where such service is specifically requested; and local conversion and reconversion of baggage cars at military installations for kitchen use; and unpacking and uncrating authorized baggage when specifically requested.

b. *Authorized baggage* is defined in AR 55-160.

c. *Preservation and packaging* are defined in memorandum 700-15-1.

4.20.1 Related Services

The term *packing and crating* as used herein does *not* include the following activities:

a. Drayage (including loading and unloading), transportation (including responsibility for ascertaining that shipping space is provided, that all necessary transportation arrangements are completed, and that shipments are made and arrive on schedule), or preparation and execution of transportation documents, all of which are the responsibilities of the Transportation Corps.

b. Weighing of shipments, which is the responsibility of the service requesting the packing and crating. However, the post engineer will do the weighing if he has the facilities available and is specifically requested to do so.

c. Preservation or packaging, which are the responsibility of the service requesting the packing and crating.

4.21. Responsibility

a. Packing and crating as defined in paragraph 4.20a above at Department of the Army installa-

tions is a repairs and utilities responsibility for which ESA Project 320 funds are applicable in the zone of interior, and ESA Project 437 funds are applicable overseas, *except* that packing and crating, other than authorized baggage or other personal property, is the responsibility of the respective chiefs of technical or administrative services at depots, arsenals, proving grounds, engineering laboratories, manufacturing facilities, and ports of embarkation. Operating funds available to the respective technical or administrative services are applicable for such activities.

b. When requested by the technical or administrative service, packing and crating of military, nonmilitary, and troop supplies and equipment will be performed by the post engineer in accordance with specifications furnished by the service requesting the packing and crating. The work is subject to final inspection and acceptance by such service. The technical or administrative service requesting the packing and crating is responsible for ascertaining that technical adequacy is obtained in packing and crating operations.

c. Packing and crating will conform to the requirements of carriers. The transportation officer is responsible for consonance of packing and crating specifications with requirements of the carrier.

d. Packing and crating of authorized baggage will be performed in accordance with TM 5-614 and requirements of the carrier.

e. Marking of shipments, and special or technical markings are the responsibility of the agency responsible for packing and crating, except that items in storage will be marked by the agency responsible for storage. Furnishing marking data and assuring proper accomplishment is the responsibility of the requesting service or individual.

4.21.1 Off-Post Authorized Baggage

Packing and crating of authorized baggage not located on a post is a function of the post engineer nearest such authorized baggage as designated by the Transportation Corps or appropriate army commander.

4.21.2 Contracts

Packing and crating may be done by contract if the urgency, volume of work, or remoteness of goods requires it.

a. Contracts for packing and crating authorized baggage when in connection with travel chargeable to Finance Service, Army funds will be executed by or for the post engineer and paid from ESA Project 320 funds in the zone of interior and ESA Project 437 funds overseas, *except* that contracts for packing and crating entered into by the individual traveler, as distinguished from contracts executed by or for post engineers (or when a commercial transportation agency assumes responsibility for packing and crating and transportation under a single contract), are a proper charge against the appropriation cited in the orders directing the travel.

b. When packing and crating are performed by contract, the service requesting the packing and crating is responsible for technical adequacy.

4.21.3 Reimbursable Packing and Crating

a. **WELFARE AGENCIES.** Packing and crating may be performed on a reimbursable basis for such authorized agencies as the American Red Cross and the YMCA occupying Government-owned or -leased buildings on a military post. To be eligible for such service, the agency must have as its objective the promotion of social, physical, intellectual, and moral welfare of military personnel. The post commander will authorize such service only if commercial facilities are not available to the agency.

b. **OTHER GOVERNMENT AGENCIES.** Packing and crating of authorized baggage, supplies, and

equipment may be performed on a reimbursable basis for Government agencies other than the Department of the Army provided that—

- (1) Sufficient facilities are available.
- (2) The agency specifically requests the service.
- (3) Other adequate facilities are not reasonably available to the agency.

c. **METHOD OF REIMBURSEMENT.** Reimbursable packing and crating will be billed on the basis of actual cost of materials, and all labor and service incident thereto in accordance with current regulations. Charges will be made under the appropriate cost accounts.

4.21.4 Utilization of Personnel

Commanders will insure that packing and crating operations are performed in such a manner as will effect the most economical and efficient utilization of personnel, space, equipment, and supplies, at a minimum cost consistent with technical sufficiency.

4.21.5 Materials

a. Materials for packing and crating will be supplied without reimbursement by the service having storage and issue responsibility therefor in accordance with Army Procurement Regulations.

b. Materials for which storage and issue responsibility has not been assigned will be supplied without reimbursement by the service responsible for packing and crating.

c. Materials for which storage and issue responsibility has been assigned jointly to the service responsible for packing and crating and to others will be furnished without reimbursements by the service responsible for packing and crating.

U.S. Govt

TM 5-600

C 7

AUG 15 1948

**TECHNICAL MANUAL
GUIDES AND PROCEDURES
REPAIRS AND UTILITIES**

Changes }
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Remove pages 73 through 76 and insert revised pages 73 through 76.

[AG 300.7 (26 Apr 48)]

BY ORDER OF THE SECRETARY OF THE ARMY:

OFFICIAL:

EDWARD F. WITSELL
Major General
The Adjutant General

OMAR N. BRADLEY

Chief of Staff, United States Army

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For explanation of distribution formula see, TM 38-405.

Section VIII. INSECT AND RODENT CONTROL

3.55 Responsibilities

The installation commander is responsible for insect and rodent control activities as follows:

a. POST ENGINEER. The post engineer will supervise and execute insect and rodent control measures to protect health and morale and preserve property at Army installations. This work includes construction, maintenance, and other operations necessary for ratproofing; screening of buildings; prevention of fly breeding; termite control; fumigating or otherwise disinfesting subsistence supplies, clothing, equipage, wood products, or other matériel; drainage of swamp areas; use of dynamite and poisonous chemicals in pest control; ditching; clearing of swamps; applications of insecticides in buildings; disinfesting and protecting grassed areas, trees, shrubs; larviciding for mosquito control; control of cockroaches, flies, ants, ticks, fleas, chiggers, and bedbugs; control of soil-infesting insects; control of rats, mice, field rodents, and predatory animals; storage of insect and rodent control supplies; care and maintenance of necessary tools and dispersal equipment; assistance with aerial dispersal of insecticides; and similar work. The post engineer will also procure, store, and issue all regular equipment and specialized items for pest control not furnished by the post supply officer. Procedures outlined in TM 5-632 and other existing directives will be followed.

b. POST SURGEON. The post surgeon will investigate the prevalence, distribution, and significant habits of insects, rodents, and other pests affecting health; recommend control measures; provide necessary technical guidance; and determine and report to the installation commander the adequacy of control or corrective measures.

c. POST SUPPLY OFFICER. The post supply officer will store and issue standard quartermaster supplies for insect and rodent control for use by the post engineer, troops, and individuals. Standard supplies include those normally used in barracks, messhalls, kitchens, bakeries, laundries, storage warehouses, and similar facilities

and for the treatment of clothing and equipage as well as for usages listed in TM 5-632 and other existing directives.

3.56. Supplies and Equipment

a. STANDARD. The post engineer will use standard supplies and equipment as authorized in TM 5-632, SB 5-53, and authorized tables of allowances so far as possible for economical and efficient insect and rodent control.

b. NONSTANDARD. Nonstandard supplies and equipment required by the post engineer for insect and rodent control will be obtained by local purchase as authorized by the installation commander concerned and are chargeable to applicable repairs and utilities funds. Such supplies may include insecticides, rodenticides, fumigants, fungicides, solvents, wetting agents, sprayers, dusters, fumigation chambers, insecticide mixers, and other materials.

c. FLYTRAPS AND FLY RIBBONS. Flytraps and fly ribbons are now considered obsolete and are no longer recommended for use at Department of the Army installations. Breeding places should be eliminated and DDT residual sprays applied periodically to places where flies rest, such as walls, doors, windows, screens, ceilings, cross beams, light cords, garbage racks, and similar places.

3.57. Personnel

Insect and rodent control personnel handle dangerous and toxic materials which include DDT mixtures, zinc phosphide, thallium sulphate, lead arsenate, Paris green, hydrocyanic acid gas, methyl bromide and sodium monofluoroacetate. Operators handling these insecticides and rodenticides will carry out established procedures and safeguards. Responsible commanders will take necessary action to assure that personnel are capable of receiving training in the handling of poisonous materials, and that they receive such training by technically qualified personnel before participating in insect and rodent control work.

3.58. Protection and Transportation of Toxic Materials

Strong boxes or other containers equipped with locks will be provided to insure the safe handling and transportation of toxic insecticides and rodenticides, such as sodium monofluoroacetate, thallium sulphate, zinc phosphide, lead arsenate, or other arsenicals, and toxic organic and inorganic insecticides. Such containers will be utilized for the storage and distribution of these toxic materials in order to prevent unauthorized access thereto and to minimize handling hazards. The policy for safe storage of toxic materials such as methyl bromide, rodenticide fumigant dust, rodenticide fumigation control and rodenticide plague control in large quantities is set forth in appendix V, TM 10-250. Hydrocyanic acid or HCN discoids, methyl bromide, and other toxic gases will be stored in accordance with the recommendations of the installation safety officer. Installation commanders will assign a vehicle suitable for the secure transportation of these toxic materials at such times as they are being applied at military installations.

3.59. Aircraft Dispersal of Insecticides

Spraying insecticides from aircraft for insect control on military reservations may provide advantages over ground methods in certain situations. However, this means of control has definite limitations and will be employed only after consideration has been given to comparative costs and effectiveness of other means, and to the possible harmful effect on beneficial insects, fish, wildlife, and agricultural crops on military reservations and in areas adjacent thereto. Determination will be made in advance as to whether or not aircraft spraying of insecticides is the most effective method and whether the expected results will justify the expense of aircraft spraying. Installation commanders who desire aerial spraying of insecticides will submit requests in accordance with current directives.

3.60. Special Phases of Work

a. **SUBSISTENCE SUPPLIES, CLOTHING, EQUIPAGE, AND OTHER MATERIAL.** The post engineer will operate and maintain apparatus and equipment and specialized fumigation apparatus used to disinfest materials in warehouses and other structures. He will assist the storage officer, as requested, at depots and warehouses, in making periodic inspection of commodities to detect infestations. Items of subsistence infested by insects or damaged by rodents may be shipped to private facilities for fumigation, cleaning, and repackaging by contract if facilities are not available at the post, or if the work cannot be done more economically at the post. Cost of contractual service for fumigation or disinfestation will be charged to applicable repairs and utilities funds; cost of contractual services for cleaning, repackaging, or renovation will be charged to applicable quartermaster funds. To assure proper operation and adequate safety precautions, the post commander will request technical assistance from the appropriate army commander before initiating a program of fumigation. Items likely to become infested by insects or damaged by rodents include rice, flour, dried fruits, coffee, stock foods, woolen goods, felts, furs, and similar materials.

b. **LUMBER, TOOL STOCK AND SIMILAR MATERIALS.** The post engineer, upon request of the storage officer, will cooperate and assist in the inspection of lumber, tool stock, and similar items for insect infestation. When infestations of wood-destroying insects are found, technical assistance for control will be requested as required from the appropriate army commander.

c. **HANDLING OF FUMIGANTS.** Storage and application of fumigants used in disinfestation of buildings and commodities are responsibilities of the post engineer, except as provided for in paragraph 3.55c.

(1) *Precautions.* Careless storage or handling of fumigants must be avoided because all recommended fumigants are toxic. Gas masks with appropriate canisters (obtain current recommendations of higher headquarters)

will be provided when fumigants are handled. Regular inspections of storage conditions of fumigants will be made by the post safety officer.

(2) *Disposition of excess fumigants.* Excess stocks of fumigants such as HCN discoids, calcium cyanide, and methyl bromide will not be disposed of at installations without prior approval of the army commander. All excess stocks of such fumigants will be turned over to the post engineer, who will report excess stocks to the army commander, who in turn will specify the means of disposal as follows:

(a) Transfer to installations within the army area for use.

(b) Sale to authorized named concerns or individuals.

(c) Destruction by the post engineer after prior notice to the post safety officer.

d. REPORT OF INSECT AND RODENT CONTROL ACTIVITIES, REPORTS CONTROL SYMBOL ENG-11 (R1). (1) *General.* DA AGO Form 5-123 (1 Jun 48) provides the data necessary to assure satisfactory accomplishment of insect and rodent control.

(2) *Frequency and preparing agencies.* A monthly report will be prepared by post engineers at Army installations (ZI) and overseas installations operating under the provision of TM 5-600. A consolidated report will be prepared as of the close of each calendar quarter by the armies (ZI) and major oversea commands.

(3) *Due dates and routing.* The monthly report will be forwarded without transmittal letter by installation commanders to reach the appropriate army (ZI) or major oversea commander not later than 10 days and 30 days, respectively, after the close of the report month. The quarterly report will be forwarded without transmittal letter to reach the Chief of Engineers, Attention: ENGMU, not later than 20 days after the close of the period reported in the case of armies (ZI) and 45 days in the case of major oversea commands. A copy of the consolidated report will be forwarded at the same time to The Surgeon General, Attention: Preventive Medicine Division.

e. COOPERATION OF OTHER AGENCIES. The Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, will provide consultation and assistance of specialists on special problems in controlling Japanese beetles, grasshoppers, mole crickets, and similar pests. The Fish and Wildlife Service, United States Department of the Interior, will assist in controlling rodents and predatory animals which menace health, destroy property, or impair public relations of the Department of the Army. Request for services of these specialists will be made by the installation commander to the appropriate army headquarters.

3.61. Property Near Military Reservations

Responsibilities of the Department of the Army and the Public Health Service for pest control on property near military reservations are covered by joint agreement between the services. Provisions of this agreement are as follows:

a. PUBLIC HEALTH SERVICE. (1) If the incidence of insects or rodents in a nonmilitary area near a military installation is believed to menace the health of the command, the installation commander may request, through appropriate higher headquarters, a survey of the area by the Public Health Service. If a health hazard exists, the Public Health Service will undertake the necessary work at its own expense.

(2) If pest insects or rodents do not constitute a significant health hazard in a nonmilitary area, but the installation commander finds that they interfere materially with the training program of troops, he may request, through the same channels, the Public Health Service to carry out the control program, subject to reimbursement from ESA funds available for insect and rodent control. The request of the installation commander will be accompanied by a full report on conditions, showing the extent and seriousness of interference with the troop training program. No control project of this nature will be initiated until a survey of the

work and an estimate of its cost are made jointly by the Public Health Service, the post engineer, and the post surgeon.

b. INSTALLATION COMMANDERS. If the conditions in *a(2)* above exist and the Public Health Service informs the appropriate army commander that it cannot carry out the desired control measure, the installation commander may direct the post engineer to accomplish the work with ESA funds available for insect and rodent control. No control project of this nature may be carried out until a survey has been requested and made as outlined in *a(2)* above. Before the post engineer enters a nonmilitary area to carry out control measures, a written

agreement providing for right of entry and waiver of claims will be entered into with the private land owner.

a. MAINTENANCE. If the Public Health Service performs control measures outlined in *a(1)* above, any necessary recurrent maintenance is a responsibility of that service. If control measures are executed as specified in *a(2)* above, necessary recurrent maintenance will be performed by the Public Health Service if available, subject to reimbursement; otherwise, it will be done by the post engineer at the direction of the installation commander. The post engineer is responsible for recurrent maintenance of control measures which he performs.

FOREWORD

This manual is a compilation of current regulations, orders, bulletins, letters, and other directives concerning repairs and utilities. Important determinations and applications of repairs and utilities policy are made readily available to commanding generals of service commands, service command engineers, division engineers, post commanders, and all other commands, agencies, and personnel at class I, II, III, and IV installations, to help them execute the repairs and utilities mission assigned them by AR 100-80.

Changes to this manual will be supplied on a page basis, and will be published as required. As change pages are received they will be inserted in their proper places, and the replaced pages destroyed.

Each page of the manual bears a date in its upper inside corner. This date is the date of the publication. Pages which represent changes will carry the date of the change; for example, "C 1, 3 Jan 46," "C 2, 27 Feb 46."

Paragraphs are numbered consecutively throughout the chapters of the manual; for example, a paragraph numbered 2.3 represents the third main paragraph in chapter 2. Paragraphs carrying additional decimal suffixes indicate newly added material; for example, a paragraph numbered 2.3.1 represents the first main paragraph following paragraph 2.3.

Pages are numbered consecutively throughout the manual. If new pages are added within the manual, the added pages will carry alphabetical suffixes—"A," "B," "C," etc. For example, if a new page is added between 11 and 12, the page will be numbered 11A. A second additional page in the same place would be numbered 11B, etc.

Forward all recommendations on additions or changes to the Repairs and Utilities Division, Office of the Chief of Engineers, Washington 25, D. C.

CONTENTS

CHAPTER 1. MANAGEMENT.	Paragraphs	Page
<i>Section I.</i> Repairs and utilities responsibilities.....	1.1-1.11	2
<i>II.</i> Funds	1.12-1.27	6
<i>III.</i> Personnel	1.28-1.35	10
<i>IV.</i> Procurement and property accounting.....	1.36-1.61	14
<i>V.</i> Miscellaneous	1.62-1.73	22
 CHAPTER 2. BUILDINGS AND STRUCTURES.		
<i>Section I.</i> General	2.1-2.6	32
<i>II.</i> Components of buildings.....	2.7-2.26	36
<i>III.</i> Housing and quarters.....	2.27-2.33	42
<i>IV.</i> Leased premises	2.34-2.39	46
<i>V.</i> Special-purpose buildings and structures.....	2.40-2.51	50
<i>VI.</i> Fortifications	2.52-2.61	54
 CHAPTER 3. ROADS AND GROUNDS.		
<i>Section I.</i> Airfield pavements	3.1-3.8	58
<i>II.</i> Roads and walks.....	3.9-3.15	60
<i>III.</i> Paving materials	3.16-3.17	62
<i>IV.</i> Railroads	3.18-3.26	63
<i>V.</i> Snow removal and winter maintenance.....	3.27-3.29	65
<i>VI.</i> Grounds	3.30-3.43	66
<i>VII.</i> Refuse collection and disposal.....	3.44-3.54	71
<i>VIII.</i> Control of insects, rodents, and other vermin.....	3.55-3.65	73
<i>IX.</i> Passive protection	3.66-3.69	77
 CHAPTER 4. SHOPS, SERVICES, AND EQUIPMENT.		
<i>Section I.</i> Shops	4.1-4.10	80
<i>II.</i> Furniture	4.11-4.19	83
<i>III.</i> Packing and crating	4.20-4.21	86
<i>IV.</i> Custodial services	4.22-4.24	87
<i>V.</i> Mess and installed equipment.....	4.25-4.30	89
<i>VI.</i> Outside maintenance tools and equipment.....	4.31-4.48	92
 CHAPTER 5. UTILITIES.		
<i>Section I.</i> Air conditioning and ventilation.....	5.1-5.2	98
<i>II.</i> Electric services	5.3-5.17	103
<i>III.</i> Fuel	5.18-5.42	108
<i>IV.</i> Heating	5.43-5.67	118
<i>V.</i> Refrigeration	5.68-5.73	126
<i>VI.</i> Water and sewage	5.74-5.91	129
<i>VII.</i> Utilities contracts	5.92-5.104	134
<i>VIII.</i> Permanently installed petroleum products storage and distribution systems.	5.105-5.115	136

CHAPTER 6. FIRE PROTECTION AND PREVENTION.

	<i>Paragraphs</i>	<i>Page</i>
<i>Section I.</i> Introduction	6.1-6.3	142
<i>II.</i> Responsibilities and functions.....	6.4-6.14	143
<i>III.</i> Personnel	6.15-6.24	145
<i>IV.</i> Funds	6.25-6.28	148
<i>V.</i> Equipment	6.29-6.44	149
<i>VI.</i> Fire stations	6.45-6.49	153
<i>VII.</i> Installed fire-protection systems	6.50-6.61	154
<i>VIII.</i> Operations	6.62-6.71	157
<i>IX.</i> Fire protection for special facilities.....	6.72-6.83	161
<i>X.</i> Cooperation with other responsible services.....	6.84-6.86	166
 READING LIST		 167
 INDEX		 170

This manual supersedes TM 5-600, 1 June 1945.

CHAPTER I

MANAGEMENT

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. Repairs and utilities responsibilities	1.1-1.11	2
II. Funds	1.12-1.27	6
III. Personnel	1.28-1.35	10
IV. Procurement and property accounting	1.36-1.61	14
V. Miscellaneous	1.62-1.73	22

CHAPTER I

MANAGEMENT

Section I. REPAIRS AND UTILITIES RESPONSIBILITIES

I.1. General

The Chief of Engineers as a staff officer of the Commanding General, ASF, has staff responsibility for all War Department Army-wide repairs and utilities functions, except as prescribed in AR 100-80 and 170-10. Commanding generals of service commands are responsible through the service command engineers on their staffs for supervising repairs and utilities work at class I, II, and IV installations. Supervision of repairs and utilities at class III installations rests with the Commanding General, AAF.

I.2. U.S. Military Academy

The Commanding General of the Second Service Command is not responsible for repairs and utilities at the United States Military Academy. He will, however, give practical assistance when necessary.

I.3. Prisoner of War Camps

Prisoner of war camps are class I installations for which commanding generals of service commands have repairs and utilities responsibilities. Prisoner of war camps are either base or branch camps. *Base camps* are permanently established for the complete administration of prisoners of war. *Branch camps* are either permanent or temporary; they are established to fill a definite work need and to administer prisoners of war under supervision and with the assistance of their base camps. Where housing facilities are to be altered; buildings, improvements, or fencing constructed; or utility services provided at War Department

expense on a site furnished by a contractor or on lands belonging to private interests or public agencies other than the War Department, the division engineer will, on request, obtain an immediate right of entry for use of the required property. He will also promptly negotiate a lease which will provide that alterations and improvements made by the Government will remain Government property with the right of removal; such leases will ordinarily be at nominal rental. (For details, see AR 100-61).

I.4. Enemy Alien Internment Camps and Conscientious Objector Camps

Commanding generals of service commands are responsible for repairs and utilities at enemy alien internment camps which are under the direction of The Provost Marshal General. Commanding generals of service commands have no repairs and utilities responsibilities for conscientious objector camps, which are a responsibility of Selective Service.

I.5. War Relocation Centers

Commanding generals of service commands have no repairs and utilities responsibilities at war relocation centers which are a responsibility of the War Relocation Authority of the Department of Interior. However, a post engineer from a post near a relocation center will be assigned as adviser, as liaison officer between the War Department and the War Relocation Authority, and as the War Department representative through whom the relocation center *will obtain* materials needed for its maintenance activities. All items furnished by post engineers will be furnished on

a reimbursement basis. Post engineers will not extend their priority ratings to relocation center projects.

1.6. Office, Strategic Services Facilities

The post engineer and the commanding officer of each strategic service detachment will prepare and submit to the Office of Strategic Services for approval, a quarterly estimate of funds required by the detachment for repairs and utilities. Approved estimates will be forwarded to the service command in which the detachment is located. The service command will then allot the necessary repairs and utilities funds to the commanding officer of the post at which the post engineer is assigned. Supplemental requests for additional quarterly funds will be submitted in the same way.

Repairs and utilities projects costing up to \$100 can be approved by strategic service detachment commanders. Projects costing over \$100 but less than \$1,000 will be submitted for approval to Headquarters, Office of Strategic Services, before detachment commanders will request post engineers to do the work. Funds available from the quarterly budget will be used and reimbursement will be made quarterly on Standard Form 1080.

For projects costing over \$1,000 post engineers will prepare WD AGO Form 5-25, which will be signed by detachment commanders and submitted to Office of Strategic Services for approval. Approved forms will be forwarded to the service command engineer for technical review before funds are allotted for the job. Reimbursement for each project will be by Standard Form 1080. Engineer equipment requisitioned from War Department centrally procured stocks will be shipped without reimbursement to the detachment commander of the strategic services unit. Accountability for Corps of Engineers property presently held by Office of Strategic Services detachment commanders on memorandum receipts from post engineers will be transferred to the detachment commander. When detachments are abandoned, the Office of Strategic Services will either ship the property to one of their other locations or to the post engineer responsible for repairs and utilities at the post at which the detachment is to be deactivated. The post engineer will then handle the property in accordance with TM 5-601 (when published).

1.7. Jointly Occupied Army-Navy Airfields

The following policy for jointly occupied Army-Navy airfields has been agreed on by the Secretary of War and the Secretary of Navy.

a. No agreements for joint use will be made if operations of aircraft of the service having jurisdiction will be obstructed by sharing the airfield. In entering into agreements the two services will be represented by their senior local cognizant officers, who will forward agreements to the department having jurisdiction over the airfield for approval and clearance with the other department.

b. A single maintenance organization under control of the service having jurisdiction of the base will be responsible for maintenance, upkeep, and repair of buildings, structures, runways, grounds, etc., and for operation of utilities systems. However, the other service will perform minor maintenance and policing of facilities which it uses exclusively. For better understanding and liaison in maintenance work, the service not having jurisdiction may, at its discretion, be represented in the maintenance organization by a public works or engineer officer.

c. The service performing the maintenance will provide funds without reimbursement by the other service.

d. Exceptions to these general provisions may be made in special instances upon joint agreement of the two senior local cognizant officers. In such cases, the responsible War and Navy Department bureaus or offices should be notified.

1.8. Jointly Occupied CAA-AAF Installations

When installations are jointly occupied by the Air Traffic Control Division of the Civil Aeronautics Administration and the Flight Control Division of AAF, the following repairs and utilities policies will be followed:

a. Alterations, additions, extensions, and other new work necessary at jointly occupied quarters will be performed and paid for by the agencies requiring that the work be done.

b. Normal maintenance and repairs and utilities required but not furnished by the lessor under the terms of the lease will be provided and paid for by the agency controlling the fee or holding the leasehold interest in the Government's name.

c. When alterations are made for the War Department on property under lease by another Government agency, the Chief of Engineers will prepare and issue a Certificate of Necessity under Public Law 530, 77th Congress, if such certificate is required. The fact that the leasehold is held by a governmental agency other than the War Department will not prevent the Chief of Engineers issuing the Certificate of Necessity.

1.9. Chemical Warfare Service and Ordnance Department Manufacturing-plant Maintenance Policy

a. GENERAL. Maintenance responsibility at industrial sections of Government-owned and operated armories, arsenals, and proving grounds of Chemical Warfare Service and Ordnance Department is divided between repairs and utilities and the operating service. Specific responsibilities of each is discussed in appropriate sections of this manual in a paragraph on manufacturing plants. The term "operation" as used in this policy includes maintenance and repair, operating personnel, supply of operating supplies, and supply of operating fuel. The term "supply" includes specification, requisition, provision of funds, and initiation of procurement.

b. RESPONSIBILITY. Responsibility in manufacturing-plant maintenance policy includes providing funds, determining work to be done, initiating work, and approving the quality of the work. Actual approval for repairs and utilities work is defined in AR 100-80. These responsibilities will not be delegated to another agency.

c. ACCOMPLISHMENTS OF FUNCTIONS. Every effort will be made to coordinate work, to eliminate overlapping of responsibility, and to avoid duplication of maintenance facilities and personnel. If shops or personnel other than those directly under an agency responsible for a function must be utilized, the agency's responsibility remains unchanged. Necessary adjustments in funds will be made in accordance with established fiscal procedures, either by quoting applicable funds on the payment documents or by using adjustment vouchers (Standard Form 1080), whichever is more expedient.

d. FACILITIES. The manufacturing-plant maintenance policy will be followed at the following facilities:

- (1) Aberdeen Proving Ground.
- (2) Springfield Armory.
- (3) Watertown Arsenal.
- (4) Picatinny Arsenal.
- (5) Watervliet Arsenal.
- (6) Frankford Arsenal.
- (7) Edgewood Arsenal.
- (8) Redstone Arsenal.
- (9) Erie Proving Ground.
- (10) Huntsville Arsenal.
- (11) Jefferson Proving Ground.
- (12) Rock Island Arsenal.
- (13) Rocky Mountain Arsenal.
- (14) Southwestern Proving Ground.
- (15) Pine Bluff Arsenal.
- (16) Savannah Ordnance Depot.

1.10. Consolidation of Administration

a. To insure greater efficiency and more economical performance of repairs and utilities activities at military installations, a class I, II, III, or IV installation must, in many instances, be based on another class I, II, III, or IV installation for repairs and utilities purposes. Such arrangements will be made with the concurrence of the commanding general of the service command, air force, or AAF command concerned. In such cases, the post engineer will be assigned to one post for administrative purposes, but will operate for technical purposes as the staff officer of the commanding officer of each military installation served.

b. Commanding generals of service commands and of appropriate air force commands are authorized to establish regional or vicinity post engineers to serve military establishments, regardless of size or class, if in their opinion that would be the most economical and efficient way to conduct repairs and utilities activities. Duplicating regional services of this type will not be established. New arrangements of this type affecting any class of installation will be coordinated with the appropriate ASF or AAF commander. In such cases, the post engineer will be the staff officer responsible to the commanding officer of each installation for the technical performance of repairs and utilities activities, but will be directly under the commanding general of the service command or appropriate AAF command for administrative purposes.

c. When a class I, II, or IV installation is

based on a class III installation or a class III installation is based on a class I, II, or IV installation, the following responsibilities will be adhered to:

(1) Funds and personnel for combined arrangements of this type will be furnished by the agency having major responsibility.

(2) Annual estimates, quarterly requests for funds, and supplemental requests for funds will be routed by the post commander to the agency having major responsibility.

(3) Commanding officers of class III, installations will be responsible to the commanding general of the air force or AAF command for proper performance of repairs and utilities; commanding officers of class I, II, or IV installations will be responsible to the commanding general of the service command for proper performance of repairs and utilities.

(4) Projects submitted under AR 100-80, will be submitted for project approval to the commanding general of the service command for class I, II, and IV installations, and to the commanding general of the air force or AAF command for class III installations.

(5) Reports of emergency work done under AR 100-80 will be submitted to the commanding general of the service command for class I, II, and IV installations, and to the commanding general of the air force or AAF command for class III installations. Additional funds required for emergency work approved under AR 100-80 will be forwarded to the agency having major responsibility.

(6) Contracts for utilities services will be entered into under supervision of the agency having major responsibility.

1.11. National Guard Camps

Repairs and utilities responsibilities at State-owned National Guard Camps leased by the War Department will be governed by the terms of the lease. The War Department has no repairs and utilities responsibilities at State-owned National Guard Camps (other than those leased by the War Department) or at Federally-owned National Guard camps licensed to the State. Such responsibilities are vested in the State. (See par. 1.27 for repairs and utilities responsibilities at State Guard Camps.)

Section II. FUNDS

1.12. Classification of ESA Project 300 Funds

Funds used for repairs and utilities purposes in accordance with AR 100-80 and AR 100-20 are classified under appropriation ESA project 300, Maintenance of Structures and Operation of Utilities, and Seacoast Defense, General project 340, Maintenance and Repair of Seacoast Fortifications. ESA project 300 is subdivided into the following five general projects:

- a. Project 301, repairs and utilities (administrative purposes only).
- b. Project 310, air force facilities (Government-owned).
- c. Project 320, ground force facilities (Government-owned).
- d. Project 330, leased facilities.
- e. Project 350, passive protection.

1.13. Approving Authorities

For policy governing approval, authorization, and routing of new construction and repairs and utilities projects at *command* installations, see paragraph 1.63.

1.14. Applicability of ESA Funds at Class I, II, III, and IV Installations

The purpose of this policy is to define the use of ESA funds required for the execution of construction and repairs and utilities activities at Government-owned and leased class I, II, III, and IV installations within the continental United States under the provisions of AR 100-70, 100-80, and other War Department directives. This policy is applicable to all construction, maintenance, repair and operations, and alterations, additions, and extensions of buildings, structures, grounds, and utilities for the Army which are accomplished with ESA funds. The definition set forth will be used by all concerned to determine the applicability of project account series 200 (subappropriation "Military Posts") funds and project account series 300 (subappropriation "Barracks and Quarters") funds under the appropriation ESA. This policy will not be inter-

preted as authorization for the use of any ESA funds in lieu of other funds, contrary to existing policy.

a. ESA PROJECT ACCOUNT SERIES 300 (SUB-APPROPRIATION "BARRACKS AND QUARTERS") FUNDS. ESA project account series 300 (subappropriation "Barracks and Quarters") funds are available to the commanding generals of service commands for class I, II, and IV installations and to the Commanding General, Army Air Forces, for class III installations. These funds are applicable to the following general classifications of work within funds available.

(1) Initial erection or installation of any building, structure, utility, grounds, or other real property built separately or apart from existing structures, the total estimated cost of which is \$1,000 or less, may be authorized and accomplished by a post commander under authority of AR 100-80 as a repairs and utilities project at both Government-owned and leased facilities.

(2) Maintenance, repair, and operation of existing buildings, structures, utilities, grounds, or other real property regardless of estimated cost, at both Government-owned and leased facilities.

(3) Reconstruction embracing such work as is necessary to restore a Government-owned or a leased building, structure, utility, grounds, or other real property, damaged or destroyed by fire, storms, etc., estimated to cost \$20,000 or less. Projects estimated to cost more than \$20,000 will be financed with ESA project series 200 (subappropriation "Military Posts") funds or series 300 (subappropriation "Barracks and Quarters") funds as determined by the Chief of Engineers.

(4) Alterations, additions, and extensions to a Government-owned or a leased building, structure, utility, grounds, or other real property, estimated to cost \$20,000 or less.

(5) Relocation or removal of all passive protection measures which have not been declared surplus by the War Department, regardless of cost.

b. ESA PROJECT ACCOUNT SERIES 200 (SUB-APPROPRIATION "MILITARY POSTS") FUNDS. ESA project account series 200 (subappropriation

"Military Posts") funds are available *only* to the Chief of Engineers. These funds are applicable to the following general classifications of work within funds available:

(1) Initial erection or installation of any building, structure, utility, grounds, or other real property built separately or apart from existing structures. (*Exception:* Those projects estimated to cost \$1,000 or less which are authorized and accomplished by a post commander under the authority of AR 100-80 as a repairs and utilities activity.)

(2) All alterations, additions, and extensions to a building, structure, utility, grounds, or other Government-owned or leased real property, estimated to cost more than \$20,000.

(3) Removal of passive protection measures if they have been declared surplus by the War Department.

c. INITIAL ALTERATIONS AT LEASED PREMISES. Initial alterations and all restorations at leased facilities will be accomplished as directed by the Chief of Engineers with funds available to division engineers having jurisdiction.

d. LIMITATIONS. Wherever a limitation is placed herein upon the cost of work in dollars (as in the phrase "estimated to cost \$1,000 or less"), such limitation will be applied to the total estimated cost as determined under the policy in paragraph 1.65.

1.15. Estimate of Funds for Repairs and Utilities Purposes

Estimates of funds needed for repairs and utilities at class I, II, and IV installations will be submitted in accordance with existing War Department directives. Estimates for repairs and utilities at class III installations will be prepared in accordance with instructions of the Commanding General, AAF. These estimates will be based on the repairs and utilities cost-accounting system, kept in accordance with TM 5-602.

1.16. Reimbursements

Funds from sales of supplies and/or services will be deposited in accordance with TM 14-700. All appropriation reimbursements will be credited to the appropriation Engineer Service, Army, Fiscal Code No. 8-C-902, and not to Replacing Engineer Service, Army. Adjustments between allotments under ESA appropriation for reimburse-

ments for equipment, supplies, and services furnished may be made by processing WD AGO Form 14-104. Expenditure refunds resulting from payment representing recoupment collections of connection charges pursuant to utilities contracts and applicable to allotment of ESA project 300 funds that has been completed will be credited to the open allotment 8-788. (See TM 14-700.) When credited to open allotment, the project number and object classification under which the expenditure was made should be shown. (See TM 14-702.) Expenditure refunds applicable to an uncompleted allotment of ESA project 300 funds will be scheduled and recorded as a reduction of expenditures under the applicable allotment.

1.17. Notification to Post Engineer

The maintenance of the repairs and utilities cost accounting system requires that the post engineer be notified of the expenditure of repairs and utilities funds. In order that the post engineer may receive current data relative to such expenditures, the duplicate copy of WD AGO Form 5-112 (old OCE Form 20 (Costs)) covering all transactions involving the disbursement of repairs and utilities funds will be submitted by the post engineer to the post fiscal officer. The post fiscal officer will indicate the amount expended and other pertinent information in the space provided on WD AGO Form 5-112 under the heading "Adjustments by Finance Section" and return the form to the post engineer.

1.18. Distribution of Funds for Repairs and Utilities Projects

Repairs and utilities funds employed in all maintenance and repair and in alterations, additions, and extensions, the estimated cost of which is \$20,000 or less, flow to the commanding general of the appropriate service command for class I, II, and IV installations and to the Commanding General, AAF for class III installations. For each maintenance and repair project in excess of \$1,000 and for each project for alterations, additions, or extensions exceeding \$1,000 but not in excess of \$20,000, funds will be made available to stations for repairs and utilities projects separately from funds made available for normal recurring repairs and utilities requirements. Funds will be

made available on the basis of approved WD AGO Form 5-25 (Individual project estimate—repairs and utilities) (prepared in accordance with WD AGO Form 5-26). For the accomplishment of this objective, funds will be authorized either by means of a WD AGO Form 14-114 (Obligation authority) or by means of a WD AGO Form 14-106 (Suballotment).

1.19. Civil Air Patrols

Repairs and utilities services performed at Civil Air Patrol (CAP) leased bases on or after 29 April 1943 will be paid for from repairs and utilities funds only if the lease makes the War Department responsible for such service. Repairs and utilities funds can be used for repairs and utilities services at CAP wings headquarters occupying a leased installation only if provided for by terms of the lease.

1.20. Nonappropriated Funds

For the relationship of the post engineer (under his repairs and utilities responsibilities described in AR 100-80) to the use of nonappropriated funds (as defined in AR 210-50 and 210-100) for construction, maintenance, and purchase of furnishings for buildings and other facilities, see WD Circular 214, 1945.

1.21. Travel and Transportation

a. CLASS I, II, AND IV INSTALLATIONS AND SERVICE COMMANDS. The applicable allotment under appropriation Finance Service, Army, can be used to pay for travel by repairs and utilities administrative personnel at service command level and by repairs and utilities personnel at class I, II, and IV installations, when the travel is on repairs and utilities duty and is directed under authority of the commanding general of the service command.

b. CLASS III INSTALLATIONS AND AIR FORCES OR ARMY AIR FORCES COMMANDS. When travel by repairs and utilities administrative personnel at air force or AAF command level and at class III installations is directed under authority of the commanding general of the air force or AAF command, the cost is properly chargeable to the open allotment under Finance Service, Army for that air force or AAF command.

c. OTHER THAN REPAIRS AND UTILITIES DUTY. Travel of service command, air force, or

AAF command repairs and utilities personnel on work not concerned with their repairs and utilities duty is chargeable to the open allotment of that service or to funds available to them.

d. CHANGE OF STATION. Travel of individuals and their dependents on permanent or temporary change of station, travel incident to troop movements, and travel of prisoners of war and guards is properly chargeable to the appropriation Finance Service, Army, under applicable allotments.

e. SHIPMENTS OF SUPPLIES AND EQUIPMENT. Open allotment 508-803 P — *03212/50905 can be used for shipping costs from *point of origin* to the *first point of storage or consumption* when shipping supplies, equipment, and material used in connection with repairs and utilities responsibilities of service commands. The cost of shipping supplies from one post to another or from a post back to a supply depot is chargeable to the appropriation Transportation Service, Army, under the appropriate procurement authority for the consignee.

1.22. Petroleum Products

The Quartermaster General will purchase all petroleum products and their containers used by AGF, AAF, and ASF. Funds administered by the Quartermaster Corps for purchasing petroleum products and their containers will be distributed through service command and AAF channels to all installations in continental United States, excluding Alaska. The quartermaster supply officer will consolidate requisitions from all using services at the installation and will requisition funds from the fiscal officer of the service command for class I, II, and IV installations and from the budget and fiscal office of the air force or AAF command for class III installations to purchase all liquid fuels, lubricants, and containers needed. Liquid petroleum products will not be procured from repairs and utilities funds available locally.

1.23. Stand-by, Excess, and Surplus Installations

Repairs and utilities funds available to commanding generals of the service commands, air forces, and AAF commands can be used for maintenance

* Applicable project account number will be used; for example, project 310 for air force facilities, project 320 for ground force facilities.

of posts, camps, and stations designated as inactive. Leased facilities funds available to division engineers can be used to maintain and guard excess or surplus leased installations transferred to the Chief of Engineers and to restore leased premises declared surplus. Surplus facilities funds available to division engineers can be used to maintain and deactivate excess or surplus Government-owned facilities transferred to the Chief of Engineers, unless other funds are specifically provided for each project.

1.24. War Relocation Centers

Repairs and utilities funds will *not* be used for War Relocation Authority projects.

1.25. Prisoner of War Inclosures, Conscientious Objector Camps, and Enemy Alien Internment Camps

Repairs and utilities funds can be used to maintain structures and operate utilities at all prisoner of war inclosures or enemy alien internment camps under direction of The Provost Marshal General. Repairs and utilities funds will *not* be used to maintain and operate conscientious objector camps, the responsibility of Selective Service, or War Relocation Centers, the responsibility of the War Relocation Authority.

1.26. Items of Personal Equipment

a. GENERAL AUTHORITY. Under sections 108.4 and 108.5, WD Procurement Regulations, commanding generals of service commands and the Commanding General, AAF, may use repairs and utilities funds locally available to purchase items of personal equipment for civilian employees engaged in repairs and utilities activities *only* when *each* of the following standards are met:

(1) The purpose for which the appropriation is made cannot be carried out as quickly and as satisfactorily from the Government's standpoint without such equipment.

(2) The equipment will not be used primarily for the personal convenience, comfort, or protection of the employee.

(3) The employee could not reasonably be required to furnish the equipment as part of the personal equipment he needs to perform the regular duties for which his services were engaged.

(4) The Government and not the civilian employee will receive the principal benefit.

(5) The equipment will remain the property of the United States and, on termination of employment or reassignment of the employee, will be surrendered for reissue to other employees.

b. DELEGATION OF AUTHORITY. This authority will *not* be delegated to post commanders. The Commanding General, AAF, may delegate this authority *only* to commanding generals of air forces or AAF commands who may not delegate it further.

1.27. State Guard Camps

Under the provisions of Public Law 356—78th Congress (WD Bull. 13, 1944) repairs and utilities funds available to commanding generals of service commands may be used for maintenance, repairs, and utilities at War Department-owned or controlled facilities used for State Guard training. Control over the obligation and use of repairs and utilities funds for State Guard training requirements is a responsibility of the commanding general of the service command and such funds will only be used when the training is an integral part of the program established by the commanding general of the service command for training the State Guard. Repairs and utilities funds will be available to commanding generals of service commands for State Guard training requirements in accordance with AR 100-80 except that alterations, additions, deletions, and rehabilitations costing \$1,000 and *under* will be made *only* upon the approval of the commanding general of the service command. Requests for acquisition of real estate or construction of new facilities will be processed in accordance with existing regulations. Under this policy, repairs and utilities funds will not be authorized for the maintenance and repair of National Guard installations even though used for State Guard training. (See par. 1.11 for repairs and utilities responsibilities at National Guard camps.)

Section III. PERSONNEL

I.28. General

Good personnel management will bring about more efficient use of manpower, and thereby reduce the size and increase the effectiveness of the work force. The post engineer will be responsible for applying to his repairs and utilities activities the principles, policies, and practices of personnel management set down by higher authority. The personnel office will assist the commanding officer and his various operating supervisors, including the post engineer, in applying these principles, policies, and practices. Although the post engineer is responsible for the final decision, consultation with the personnel office on specific cases will help him choose authorized courses of action.

I.29. Organizing Work Force

By applying approved yardsticks and work-measurement standards to anticipated work loads, the post engineer will estimate his minimum civilian-personnel requirements and notify the post commander accordingly. He will be responsible to the post commander for building a sound organization in which functions are logically grouped, lines of authority are clear-cut without duplication, and individuals are well suited and highly skilled in their jobs. The personnel officer will furnish classification and wage analysts to help determine proper classifications for both graded and ungraded positions, appropriate duties for specific positions, and necessary job descriptions. After the post commander has approved the recommended ceiling for post engineer personnel, the post engineer will be responsible for keeping his total work force within these limits, making necessary strength reports, and keeping the post commander informed of work loads, changes in functions, and anticipated changes in personnel requirements. Frequent work-load studies will be useful to insure that proper personnel strength is maintained.

I.30. Procuring Personnel

The post engineer will transmit to the personnel office properly prepared requisitions for personnel. The personnel office will keep in direct con-

tact with the Civil Service Commission and other recruiting agencies, will initiate and supervise testing programs, screen applicants, develop methods of locating unused skills and capabilities, maintain placement-service records, and provide intrainstallation transfer systems. The post engineer will select employees from candidates furnished by the personnel office or from personnel under his own supervision and will cooperate in the post program of recruiting and in-service placement by transfers and releases to make maximum use of manpower. The post engineer will recognize that while speed is desirable in recruiting, ample time should be given the personnel officer to discharge his responsibility efficiently.

I.31. Maintaining High-Work Productivity

Job training, evaluation of job performance, and adjustment of the individual to his job are important factors in accomplishing maximum individual productivity. The post engineer and the personnel officer can both attain this goal.

a. POST ENGINEER. If he is to obtain maximum individual productivity from his personnel, the post engineer must—

(1) Apply training programs suitable to his specific operations with additional on-the-job training when necessary.

(2) Select his supervisory employees carefully.

(3) Provide working conditions which insure the well-being, health, and safety of his employees.

(4) Train employees in safety and accident prevention measures.

(5) Initiate a worth while employee-suggestion program.

(6) Counsel on personal problems and follow an approved procedure for handling grievances.

(7) Set up a program for continuous on-the-job evaluations in addition to the periodic evaluation prescribed by the Civil Service Commission.

(8) Develop a promotion program which complies with post policy. This program should arrange jobs in the line in which advancement may be expected as well as provide for shifts from unit to unit within the organization.

(9) Avoid recruiting new employees for positions which can satisfactorily be filled by promotion or reassignment within the organization.

(10) Establish sound wage schedules and keep them in line with operating conditions through periodic review. Apply these schedules properly to insure that grades coincide with job content and the employees actually perform the duties of the job description.

b. PERSONNEL OFFICER. The personnel officer can assist in maintaining high-work productivity of employees by cooperating in training and evaluation programs. He may provide counseling service on personal problems, help handle grievances, and assist in problems of supervision and inadequate working conditions. He will assist the post engineer's employee-suggestion program and furnish information on policies concerning promotion and separation.

1.32. Funds for Payment

Payment of civilian personnel engaged in repairs and utilities work at posts, camps, and stations (including repairs and utilities property accounting) is properly chargeable to applicable repairs and utilities funds as listed in paragraph 1.12. Funds available to division engineers for repair and maintenance of engineer military equipment and for military surveys and maps may be charged for payment of post engineer civilian employees, under limitations contained in applicable instructions of OCF.

1.33. Enlisted Personnel

The policy of the War Department is to employ civilians (within the civilian personnel ceilings determined by the Bureau of the Budget) on all tasks of whatsoever nature, except those, proper performance of which require military skills or which for training, security, or disciplinary reasons must be performed by military personnel. Generally speaking, repairs and utilities activities do not fall within the categories excepted above.

a. CLASS I, II, AND IV INSTALLATIONS. Enlisted personnel will not be employed in repairs and utilities activities at class I and II installations unless specifically authorized by the commanding general of the service command. The chief of the technical service concerned will follow the same policy at class IV installations.

However, service commands may furnish enlisted personnel for repairs and utilities work at isolated installations or at installations where other conditions make use of civilian personnel impossible. If difficulties are encountered in supplying adequate civilian personnel at class I, II, and IV installations, the possibility of utilizing enlisted personnel should be investigated because the Commanding General, ASF, through the commanding generals of service commands, is responsible for furnishing qualified personnel for repairs and utilities activities at such installations.

b. CLASS III INSTALLATIONS. The Commanding General, AAF, is responsible for furnishing personnel for repairs and utilities activities at class III installations; use of enlisted personnel instead of civilians will be governed by directives of the Commanding General, AAF.

1.34. Prisoner of War Labor

a. EMPLOYMENT BY POST ENGINEER. Prisoners of war will be used by post engineers only in accordance with the following policies:

(1) When civilian labor is available, prisoner of war labor will not be used.

(2) In the event that civilian labor is not available and the use of prisoners of war is necessary for the completion of the project, the prevailing wage or price per unit for the same type of work will be applied against the appropriate cost account, but will not be charged to appropriated funds. The wage will not be paid to the prisoner of war by the post engineer.

(3) Prisoners of war will be utilized to the maximum in the establishment, conversion, maintenance, and dismantlement of security and housing facilities for prisoners of war and for essential guard facilities. In doubtful cases, the matter of their use should be referred to the commanding general of the service command (for class I, II, and IV installations) or air force or command (for class III installations). Cases which cannot be resolved by such commands should be promptly referred to the Chief of Engineers, Attn: Labor Division, or the Commanding General, Army Air Forces, as appropriate.

b. LABOR POLICY. The War Manpower Commission and representatives of Building and Construction Trade Department of the American Federation of Labor have concurred in the above

policies with respect to the use of prisoners of war on construction (including construction performed on behalf of division and district engineers) and maintenance work accomplished by post engineers. Any dispute with labor organizations concerning the policy of the use of prisoners of war will be settled, when possible, at the local level. In the event that a settlement cannot be accomplished locally, the matter will be referred through the division engineer to the commanding general of the service command for his decision. All staff guidance above that level will be furnished through regular channels. In cases of misunderstanding concerning application of this policy, there will be no stoppage of work pending presentation by the unions of the misunderstanding to the Building and Construction Trade Department of the American Federation of Labor.

c. USE AT CLASS III INSTALLATIONS. Requests for assignment of prisoners of war to post engineers at class III installations will be forwarded through channels to Commanding General, AAF in accordance with instructions issued by Commanding General, AAF.

d. USE IN GROUNDS MAINTENANCE. Utilitarian grounds maintenance work, and dust and erosion control work, have been classified as priority one work for accomplishment by prisoner of war labor. Specifically, grass cutting by prisoners of war as priority one work is authorized at:

(1) General, regional, convalescent, and station hospital areas.

(2) Dust and erosion control areas covered with grass.

(3) Areas within and adjacent to flying operations at airfields.

Note. Prisoners of war will not be used for cutting grass which should normally be cut by troops as a part of their housekeeping duties.

1.35. Labor for Construction

a. CONTRACT BASIS. Except where construction tasks are necessary to provide essential training for specialized troop units, construction work as defined in *d* below, performed by or for the several branches of the Army, will be performed on a contract basis wherever practicable. Where practical considerations prevent compliance with this requirement, construction work will be performed with hired labor or, if feasible, and if

proper under the provisions of paragraph 1.34, with prisoner of war labor.

(1) When it is not consistent with security regulations to let contracts for construction work, as defined in *d* below, or to use prisoners of war or hired labor on such work, it may be performed by civilian employees ordinarily employed on maintenance work as defined in *d* below.

(2) The completion of specific construction projects, including original installation of equipment, will also be accomplished in accordance with the policy stated herein. Completion of specific construction projects may be accomplished by maintenance forces only when to do otherwise would result in interference with or interruption of production or would demand wasteful retention of a construction supervisory overhead organization.

b. PRISONERS OF WAR. Whenever prisoners of war are used on any construction work on posts, camps, or stations, that fact and the surrounding circumstances will be brought to the attention of representatives of organized building trades workers and the appropriate representatives of the War Manpower Commission in the area through existing military channels. No new channels will be established for this purpose.

c. TROOPS. Troops may be used for construction work only where such tasks are necessary to provide essential training for specialized units. The Commanding Generals, Army Ground Forces, Army Air Forces, and Army Service Forces, are responsible for determining when military personnel under their command may be employed on construction projects for the purpose of troop training, and that in making such determination, they will be governed by the following:

(1) Construction by troops will be limited to projects involving an expenditure for materials of less than \$25,000. Examples are simple emergency facilities essential to the health of troops or preservation of property, such as screened kitchens, theater type shower facilities, screened latrines, warehouses without flooring, grease and wash racks. Projects requiring an expenditure of more than \$25,000 for materials will not be undertaken without special approval by the War Department. Commanding generals of the three major commands will submit such requests through the Assistant Chief of Staff, G-4.

(2) No project will be undertaken which cannot be completed by the specialized units under training without the employment of skilled civilian labor.

(3) Military personnel so employed will not be used in such localities or in such manner as to come in competition with, or to deny employment to, civilian labor available in the locality.

d. **DEFINITION OF CONSTRUCTION.** As used in this paragraph, "construction work" refers to work of a type generally performed by a construction contractor, which is nonrecurrent and temporary in the sense that it terminates on the

completion of a specific project. In general, this includes such work as the erection of new structures or substantial alterations to existing structures. It is to be distinguished from maintenance work which is regular and recurring work, and which is continuous in the sense that it is not terminated on the completion of a specific project. This includes such work as repair, adjustment, overhauling, and upkeep of existing structures or installations. Maintenance work also includes that type of movement of machinery and installation of equipment and alteration work incident thereto specified in paragraph 911.5, Procurement Regulation 9.

Section IV. PROCUREMENT AND PROPERTY ACCOUNTING

I.36. Procurement Procedures

Post engineers are responsible for obtaining stocks of material, supplies, equipment, and repair parts for use in repairs and utilities activities.

a. CLASS I, II, AND IV INSTALLATIONS. Post engineers may be appointed purchasing and contracting officers by the commanding general of the service command at class I, II, and IV installations; in that capacity they can execute procurement and service contracts. Post engineers will follow contracting policies set forth in War Department Procurement Regulations. At such installations operating a centralized purchasing and contracting service for local procurement of post supplies, the post commander may determine whether the central purchasing and contracting service or the post engineer will procure repairs and utilities, supplies and services. This decision will be subject to instructions of the commanding general of the service command. There is no restriction on designating the post engineer to furnish central purchasing and contracting service for class I, II, and IV installations.

b. CLASS III INSTALLATIONS. At class III installations all stocks of material, supplies, equipment, repair parts and services in connection with repairs and utilities activities will be purchased by the central contracting office established by the provisions of AAF regulations. Where authority is contained in this manual for the local purchase of stocks of material, supplies, equipment, repair parts and services by post engineers, this authorization will be deemed to apply to AAF contracting officers at all class III installations.

c. CONTRACTING OFFICERS. In accordance with the provisions of War Department Procurement Regulations, a contracting officer of a particular technical service, service command, or the AAF may execute contracts on behalf of any other service when the necessary funds, if any, have been made available.

I.37. Procurement of Items

a. NOT OVER \$1,000. AR 100-80 authorizes the post commander to approve purchases of individual items of repairs and utilities equipment at

any one time and place in amounts not exceeding \$1,000, with the following exceptions:

- (1) Restricted-issue and limited-issue items of materials and equipment.
- (2) Controlled items of engineer equipment.
- (3) Motor vehicles.

(4) Items of materials and equipment for which purchase responsibility is assigned to services other than the Corps of Engineers.

(5) Further limitations on local purchases set by the service command engineer or commanding general of the air force or AAF command.

b. OVER \$1,000. Requests for purchase of individual items of repairs and utilities equipment at any one time and place in amounts exceeding \$1,000 will be forwarded for approval to the commanding general of the service command by class I, II, and IV installations, or to the commanding general of the air force or AAF command by class III installations. Requests will be made on WD AGO Form 5-25. Those submitted by class III installations will be reviewed for technical sufficiency by the service command engineer. The commanding general of the service command, air force, or AAF command can approve the purchase of individual items of repairs and utilities equipment at any one time and place in an amount not to exceed \$10,000 for items in *a* above. *All* requests for individual items in excess of \$10,000 will be submitted to the Chief of Engineers for approval.

c. ADDITIONAL RESTRICTIONS. Materials to supplement established station stock levels may be purchased from funds available to the post for purchasing repairs and utilities materials. *Except in emergencies, items which appear on the service command engineer's excess list and are available for transfer will not be purchased locally.*

I.38. Local Purchases

The War Department planned-procurement program authorizes use of repairs and utilities funds for local purchase of repairs and utilities items not furnished by central procurement. Purchases for repairs and utilities needs will be limited to absolute necessity within the spirit and intent of War Department policy.

1.39. Exchanges of Property

Under the provisions of statutes cited in Procurement Regulation 7-315, deteriorated, unserviceable, or obsolete post engineer property, equipment, and supplies may be exchanged for other similar articles. The agency authorized to administer the exchange is the purchasing and contracting officer for repairs and utilities property. All exchanges are subject to the current cost and material limitations on the purchase of supplies and equipment. An item, the price of which, including the value of property given in exchange, is in excess of \$1,000, or the purchase of which has been restricted by higher authority will not be given in exchange or obtained by stations through exchange without the approval of the appropriate higher headquarters. The purchase order involved in the exchange of property will state the terms of the exchange. The property copy of this order will serve as a voucher both to drop the item being turned in and to pick up the new item.

1.40. Contracts for Repairs and Utilities Work

Whenever feasible, contracts entered into for repairs and utilities work covering construction, alteration, repair, or other improvements to real property at class I, II, III, or IV installations will be executed on a fixed price basis. Cost-plus-a-fixed-fee contracts *will not* be entered into by service commands or air force commands for repairs and utilities work at class I, II, III, or IV installations. Contracts for the accomplishment of repairs and utilities work at class I, II, III, and IV installations will be executed in accordance with the provisions of PR 240. When the only practicable method of contracting for such work is on a cost-plus-a-fixed-fee basis, request will be made through the commanding general of the service command or air force command to the major command concerned who will request technical review of the Chief of Engineers.

1.41. Rentals of Repairs and Utilities Equipment

Rentals of repairs and utilities equipment (installed or movable) by post engineers for use on posts, camps, and stations are normally in lieu of purchases and must, therefore, not be con-

summated without prior approval of the same officers which have authority to approve the purchase of the item. The following general exceptions to this policy will be observed:

a. Outside construction and maintenance equipment needed for the accomplishment of approved repairs and utilities projects may be rented for a period of 30 calendar days. Such rental may be renewed when unforeseen circumstances arise which delay completion of the job (such as bad weather, lack of material, and break-downs) for an additional period of not more than 30 calendar days, provided that the same offices which have authority to approve the purchase of such equipment are notified of this renewal.

b. Other repairs and utilities equipment may, in case of emergency, be rented for a period not exceeding 30 calendar days, provided that the same offices which have authority to approve the purchase of such equipment are notified of this rental.

1.42. Requisitions

Requisitions will be prepared on WD AGO Form 445 (Requisition); QMC Form 400, modified to conform to WD AGO Form 445, may be used until its supply is exhausted. Filling in all columns on the requisition form properly is sufficient justification for items requested to replenish authorized station stock levels. Basis and justification will be fully explained on the requisition form for items not authorized for stockage by the post engineer and for items requisitioned in excess of authorized station stock levels. The post engineer is responsible for accuracy of requisitions.

Note. A requisition is a basic communication and requires no letter of transmittal.

1.43. Stock Numbers and Standard Nomenclature

Requisitions submitted to depots and division engineer warehouses for materials, equipment, and supplies used by post engineers will show stock number and standard nomenclature prescribed for standard items in ASF catalog ENG 5. Service command stock numbers and nomenclature lists or accepted commercial nomenclature will be used for items not listed in the catalog.

1.44. Classification of Property

Post engineers will classify repairs and utilities property by the property classification set forth in TM 5-601 (when published). For a guide to the type equipment to be posted to the real property records, see the list of class P nonexpendable property in TM 5-601.

1.45. Accountability for Repairs and Utilities Stock

Post engineer repairs and utilities property accounts will be kept on WD AGO Form 5-104 (Stock Record Card), separately from consolidated property records at posts, camps, and stations. Accountability of all post engineer property, including materials and supplies, will be administered in accordance with procedures in TM 5-601.

1.46. Accountability Records for Real Property

Post engineers will keep accountability records for repairs and utilities real and installed property on real property record cards, WD AGO Forms 5-47 through 5-52. (See AR 35-6520 and TM 5-601.)

1.47. Accounting for Built-in Cupboards, Cabinets, and Shelves

Built-in cupboards, cabinets, and shelves, with or without doors, are normally considered to be a part of the building and will not be specifically accounted for. Standard or nonstandard cupboards, cabinets, and shelves constructed by post engineer, other than those constructed as a part of the building, will be shipped to the requisitioning agency in accordance with provisions of paragraph 4.5 and will be carried on the records of the appropriate supply officer. The shipping document used will not be assigned a repairs and utilities property voucher number. The receipted copy of the shipping ticket, property issue slip, or other form used to transfer the item to the requisitioning agency, will be attached to the related work order and filed as prescribed in paragraph 4.5 as a delivery receipt.

1.48. Transfer of Accountability for Real Property

a. GENERAL. ENG Forms 290, 290A, 290B, 290C, and 290D (available only through CE channels) will be used to transfer real property; they will act as the transferring voucher except as provided in paragraph 1.49.

b. OUTPOSTS. When an outpost is transferred, the post engineer at the transferring station will deliver real property record cards (WD AGO Forms 5-47 through 5-52) to the post engineer accepting responsibility for the outpost. Property vouchers posted to the real property cards for the outpost will remain in the voucher files of the original post. To complete the records of the original post, a certification, substantially as follows, will be placed on each of the unaudited vouchers so posted:

I certify that the property listed hereon has been recorded on the real property records of _____, an outpost, the accountability for which has been transferred to (name of new main post).

(Signed: Post engineer)

Service command property auditors accept this certificate as evidence that the property, dropped from the regular stock record account, has been picked up on real property records as required by AR 35-6740.

1.49. Surplus Installations

Accountability for property on the post engineer's stock, real and installed property records at a surplus installation will be transferred to the Chief of Engineers by a certificate, as provided in AR 35-6680, except that the term *Property Records* will be substituted for *Stock Record Account*. This certificate will be supplemented by WD AGO Form 5-104; WD AGO Forms 5-47 through 5-52; maps; drawings; specifications; and all vouchers and papers supporting postings to the property records.

1.50. Real Property Records for Leased Premises

a. COOPERATION WITH DIVISION ENGINEER REAL ESTATE REPRESENTATIVE. When notified

by a real estate representative of the division engineer that a lease is to be allowed to lapse or that release of the Government from a lease is to be negotiated, the post engineer will—

(1) Remove critical items of Government-owned installed equipment and items currently needed at another installation for which the post engineer is responsible. The equipment will then be returned to stock and WD AGO Form 5-48 will be credited and placed in an inactive file.

(2) Compile an inventory of all remaining post engineer equipment on the premises. The inventory will include Government-owned property in stock or permanently installed in buildings. A copy of this inventory will be furnished the division engineer's real estate representative for use in negotiations with the lessor. Items of equipment listed on the inventory will not be removed pending negotiations between real estate representative of the division engineer and lessor.

When negotiations are completed and if return of the premises with all or part of the Government-owned equipment is in the Government's best interest and is agreeable to the lessor, the post engineer will receive a copy of the supplemental agreement providing for sale of the equipment to the lessor; this copy will serve as a voucher to drop equipment from WD AGO Form 5-48.

(3) Remove promptly all equipment and property not sold to lessor. Installed equipment will be returned to stock and WD AGO Form 5-48 credited and placed in an inactive file.

b. DISPOSITION OF RECORDS. WD AGO Forms 5-47 through 5-52 for buildings and installed equipment no longer leased by the Government should be placed in an inactive file. (See TM 5-601 (when published).) When a leased premise has been vacated by the War Department, stock records and real property records will be transferred to an inactive file at the post engineer's main post; if he has no other station, they will be disposed of in accordance with AR 35-6700 and 345-10.

1.51. Disposition of Unserviceable Property

a. FAIR WEAR AND TEAR. When repair of unserviceable property worn out through fair wear and tear is beyond the facilities of the post engineer's shops or of combined maintenance shops,

the property will be recorded on Property turn-in slip (WD AGO Form 447), delivered to the salvage officer, and dropped from the stock record card. This form will be used as a credit voucher to the property accounts.

b. OTHER THAN FAIR WEAR AND TEAR. Property rendered unserviceable by means other than fair wear and tear will be placed on Report of Survey (WD AGO Form 15).

c. DETERMINATION OF DISPOSAL. Technically qualified personnel on the post engineer's staff and shops may be used to determine whether property is to be forwarded to higher echelon for repair or turned over to the station salvage officer. If technically qualified personnel are not available locally, the service command engineer, as a staff officer of the commanding general of the service command, is responsible for providing them. These technical inspectors also determine the disposition of unserviceable major items of post engineer property such as motor vehicles, power-operated construction equipment, and power-operated kitchen, shop, and utility equipment. The commanding general of the service command acts as a depot and is responsible for disposition of unserviceable post engineer property at class I, II, III, and IV installations.

1.52. Stock Control

The inventory program will include a complete inventory or cycle inventory of critical items at least quarterly and of all items at least semiannually. (See TM 38-220.) Station control levels will be established for all items of post engineer stock and posted to stock record accounts. (See TM 38-220 and current procedures.) Class I, II, III, and IV installations will report excess repair and utilities items to the commanding general of the service command monthly on WD AGO Form 5-65 (R & U Excess Property Report).

1.53. Supply and Redistribution of Repairs and Utilities Property

a. REDISTRIBUTION. Commanding generals of service commands are responsible for redistributing all excess repairs and utilities property at class I, II, III, and IV installations. This includes installed items excess because of permanent discontinuance of operations, change in facility utilization, or changing conditions, as well as items

carried in stock. Excess repairs and utilities items will be reported to the commanding general of the service command, attention the service command engineer. Repairs and utilities property will not be shipped without authority of the service command engineer. All requests for transfer of items between stations or between stations and depots or redistribution centers will be directed to the commanding general of the service command, attention the service command engineer. Commanding generals of service commands are not authorized to issue orders effecting the transfer of equipment that is installed or in use at class III installations except where such equipment has been reported as excess by the station. The Commanding General, AAF, is responsible for designating the type and quantity of repairs and utilities property which will remain at an inactive class III installations for future use. To determine the true status of items of equipment at class III installations when voluntary declaration is not made, the following action will be taken:

(1) Where equipment considered excess to station requirements is disclosed by technical inspections, the commanding general of the service command will advise the commanding general of the air force or command concerned. Information submitted will include all pertinent details regarding the equipment and reasons for considering it excess to station requirements, with the request that consideration be given to directing that the equipment be declared excess.

(2) The air force or command concerned will either request the station to declare the items excess or determine justification for retention.

(3) If the air force or command concerned determines the equipment is required by the station, the commanding general of the service command will be so advised.

Note. This procedure does not apply to equipment furnished a class III installation on a temporary loan basis.

b. SUPPLY. To expedite supply of repairs and utilities items, requisitions for repairs and utilities items needed at class I, II, III, and IV installations will be submitted and processed as follows:

(1) Post engineers will submit to the commanding general of the service command, attention the service command engineer, requisitions for all repairs and utilities items procured, stored,

and issued by ASF. Requisitions should include complete justification and any available information on known sources of supply. If the requisition is approved after review for technical sufficiency and stock-control compliance, the service command engineer will—

(a) Supply limited-issue items from engineer depot stock, service command engineer contracts, or excess stocks.

(b) Extract requisitions for restricted-issue items and forward them to OCE with recommendations. OCE will supply approved items from engineer depots or excess stocks.

(c) Supply excess items, issue of which is not restricted or limited, from any available source.

(2) Any requisitions submitted by class III installations and disapproved by the service command engineer will be forwarded with reasons for disapproval to the commanding general of the air force or AAF command; disapproved requisitions of class I, II, and IV installations will be returned to the post.

(3) Requisitions by class III installations for unavailable excess items ((c) above) will be forwarded by the service command engineer to the commanding general of the air force or AAF command, recommending authorization of local purchase; similar requisitions by class I, II, and IV installations will be forwarded to the post with authorization for local purchase.

(4) Requisitions submitted by class III installations to the service command engineer requesting restricted items individual in demand and/or justification and for which no policy or procedure on requirements have been established will be forwarded to the Commanding General, AAF. The service command engineer will forward requisitions for such items by class I, II, and IV installations to the Chief of Engineers.

1.54. Service Command Repairs and Utilities Warehouses

a. ESTABLISHMENT. Commanding generals of service commands are authorized to establish service command repairs and utilities warehouses to—

(1) Provide a facility for the storage and issue of those items of repairs and utilities supplies and equipment which can be supplied most

economically by centralized procurement, storage, and issue.

(2) Permit the reduction of station stocks of critical items and those items required for standby or emergency purposes to a bare minimum by providing a ready source of supply.

(3) Effect a reduction in repairs and utilities expenditures utilizing excesses developed through stock control measures to the greatest extent practicable.

(4) Aid in the removal and redistribution of excess stocks.

b. LOCATION. Such warehouses will normally be established in existing buildings at War Department installations. If existing facilities are not available, established procedures for acquisition or construction of new facilities will be followed.

c. OPERATION. The operations of service command repairs and utilities warehouses will be governed by applicable provisions of TM 5-601 (when published).

1.55. OCE Centrally Procured Items

The Chief of Engineers centrally procures, stores, and issues certain selected equipment and supplies required by posts, camps, and stations for repairs and utilities purposes. These items are available for issue from engineer depots or engineer sections of ASF depots and are listed in SB 5-53. Repairs and utilities funds will not be utilized for local purchase of these items without specific authority from OCE. Requisitions will be submitted in accordance with SB 5-53.

1.56. Controlled, Restricted-issue, and Limited-issue Equipment

a. CONTROLLED ITEMS. Controlled items are items which are scarce, costly, essential for organizational missions, or specially designed for certain units or missions. The War Department maintains centralized control of their distribution.

b. RESTRICTED-ISSUE ITEMS. Restricted-issue items are critical or major items whose issue, re-issue, and disposal are controlled by OCE.

c. LIMITED-ISSUE ITEMS. Limited-issue items are those which are distributed by division or service command engineers. Unless specifically exempted by OCE, they are issued only to pro-

jects at stations within the boundaries of the service command.

d. LISTING OF ITEMS. For a list of Corps of Engineers items distributed under War Department control, see WD Circular 191, 1945. Current OCE directives list items of materials and equipment which are currently designated by the Chief of Engineers as restricted-issue and limited-issue items for construction, repairs, and maintenance purposes.

e. SUPPLY CHANNELS. Requisitions by class I, II, III, and IV installations for controlled, restricted-issue and limited-issue items will be forwarded through service command engineers.

1.57. Transfer of Housekeeping Supplies and Equipment to Navy Department or Veterans Administration

a. AUTHORITY. The Commanding General, ASF has authorized transfer to the Navy Department or Veterans Administration of certain housekeeping and medical supplies and equipment in posts, camps, and stations which are made available to those departments by the Chief of Engineers.

b. ITEMS NOT TO BE TRANSFERRED. The following will not be transferred without approval of the Chief of Engineers:

(1) Controlled items of equipment. (See par. 1.56.)

(2) Property listed in Tables of Organization and Equipment, and all items of field equipment, whether or not listed in such tables.

(3) Items listed as critical in SB 38-1.

(4) The following Corps of Engineers supplies and equipment:

(a) Shovels, power-operated.

(b) Clam buckets.

(c) Draglines.

(d) Coal-handling equipment.

(e) Chlorine cylinders.

(f) Uninstalled complete air conditioning units, ventilating fans, refrigerators, and water coolers.

(g) Freon or freon cylinders.

(h) The following motorized fire fighting equipment:*

1. Truck, fire, brush, class 300, 4 x 4 chassis.

* These items of equipment will be withdrawn and replaced with suitable equipment from Corps of Engineers stock.

2. Truck, fire, pumper, class 325, 4 x 4 chassis.
3. Truck, fire, pumper, class 750, 4 x 2 chassis.

1.58. Troop Supply

Repairs and utilities services will not include furnishing supplies or equipment to troops or organizations, except for engineer training programs or when furnishing such items is incidental to post repairs and utilities activities. For field exercises, only repairs and utilities work incidental to preparing housing for troops will be furnished.

a. INCIDENTAL TO REPAIRS AND UTILITIES ACTIVITIES. In determining the justification for and in the distribution of supplies and equipment to troops for use in repairs and utilities work, the post engineer will give full consideration to their critical nature and will not issue such items when required for projects of a higher priority. The post engineer will supervise and control all such work performed. The required supplies and equipment as approved by the post engineer will be issued only on a properly approved work order. Stock piles for troop units are not contemplated; thus, only supplies and equipment for a specific job will be issued. All nonexpendable supply items will be issued to a custodial officer who will be the accountable officer for them. All expendable supplies will likewise be issued to the custodial officer for distribution. In all issues of any variety to troop units, the post engineer will deal with the appropriate custodial officer and not with the unit commander.

b. HAND TOOLS FOR GARDENING. Simple hand tools (hoes, rakes, spades, picks, etc.) necessary for the planting, cultivating, and harvesting of vegetable gardens operated in connection with rehabilitation program at disciplinary barracks and rehabilitation centers or operated to replace regular rations at prisoner of war camps, are obtainable through quartermaster supply channels. No hand tools for gardens operated for any other purpose will be purchased from appropriated funds or issued from existing stocks.

c. DISCIPLINARY BARRACKS. Repairs and utilities funds are not available for the furnishing of tools and equipment used in vocational training activities of disciplinary barracks. Such tools and

equipment should be purchased from vocational training funds available to the disciplinary barracks.

1.59. Janitorial Supplies

See paragraph 4.23.

1.60. Office Supplies and Equipment

Local purchase of office supplies and equipment is not authorized. Such items will be obtained by requisition on the station supply officer without reference to any higher authority.

1.61. Supply and Use of Cylinders for Gases

a. CYLINDERS FOR FREON-12 FOR REPAIRS AND UTILITIES PURPOSES. See paragraph 5.70.

b. CYLINDERS FOR CHLORINE FOR REPAIRS AND UTILITIES PURPOSES. See paragraph 5.85.

c. CYLINDERS FOR FREON-12 AND CHLORINE FOR OTHER THAN REPAIRS AND UTILITIES PURPOSES. See SB 5-49.

d. CYLINDERS FOR OTHER GASES FOR ANY PURPOSE. See SB 5-49.

e. USE OF GOVERNMENT-OWNED CYLINDERS. Government-owned cylinders which are available for supply from engineer depots and engineer sections of ASF depots will be obtained up on requisition to replace those rented from commercial firms. No 1-ton cylinders for chlorine are in this stock. Rented cylinders of types which can be obtained from Government-owned stocks will be returned to their owners and the practice of renting cylinders from commercial firms will be discontinued unless they are not available from Government-owned stocks.

f. RETURN OF RENTED CYLINDERS. Care should be taken in returning cylinders to commercial firms to protect the interests of the Government. Cylinders owned by the Government are usually marked with the letters "WD" or "USA" followed by a serial number. Where deposits have been made on cylinders, complete refunds of amounts due the Government will be collected. If title to the cylinders has reverted to the Government under terms of the original purchase order or contract or through forfeit of deposit, or if ownership of the cylinders cannot be ascertained by the post engineer, the cylinders will be re-

ported to the service command engineer giving complete information with respect to all markings and serial numbers. When ownership of such cylinders cannot be readily established by the

service command engineer, the report, including all information available, will be forwarded to the division engineer for necessary disposition action including the issuance of shipping instructions.

Section V. MISCELLANEOUS

I.62. Posts

When used in connection with repairs and utilities, *post* or *Army post* will include an arsenal, air base, airfield, camp, depot, fort, hospital, proving ground, station, or similar military reservation or establishment under War Department control.

I.63. Approval, Authorization, and Routing of New Construction and Repairs and Utilities Projects at Command Installations

Projects at Government-owned installations of the types and within the limits prescribed may be authorized or directed by the War Department echelons listed below; these echelons may also authorize and direct the accomplishment of such projects at leased facilities provided they are within the limits prescribed below, and provided that a Certificate of Necessity under Public Law 530 is obtained, if necessary. Where limitations are established herein as maximum (for example, "\$10,000 or less") the Commanding General, Army Air Forces, the Commanding General, Army Service Forces, or their intermediate commands or subcommands may establish such lower limitations as they desire. Intermediate commands or subcommands are authorized to disapprove any such projects without forwarding them to higher headquarters. It is the responsibility of all concerned to take such action as may be necessary for compliance with policy and protection of interests of the War Department.

a. **NEW CONSTRUCTION PROJECTS.** The initial erection or installation of any building, structure, utility, grounds, or other real property built separately or apart from existing structures.

(1) *Estimated cost of \$1,000 or less* (except as provided in (4) below). Class I, II, III, and IV installations—Post commanders—Subject to current War Department construction policies.

(2) *Estimated cost of \$25,000 or less* (except as provided in (4) below). (a) Class I, II, and IV installations—Commanding General, Army Service Forces—Subject to establishment of military necessity by the using service concerned and to War Department construction policies.

(b) Class III installations—Commanding General, Army Air Forces, after technical review by the Chief of Engineers—Subject to establishment of military necessity by the using service concerned and to War Department construction policies.

(3) *Estimated cost in excess of \$25,000*—War Department—Each such project will be forwarded to the Assistant Chief of Staff, G-4, War Department General Staff, by the major command concerned, with complete description of the proposed work, a detailed justification of its essentiality to fulfillment of the mission of the particular installation, a firm estimate of cost by the Chief of Engineers, the ESA Project Account to which it is proposed to charge the expenditure, and a certification by the Chief of Engineers that the project is in accordance with or involves exception to current War Department construction policy.

(4) Any project of permanent type construction estimated to cost in excess of \$1,000, or any project which is a portion of a program consisting of a series of similar projects at one or more installations or which will require prosecution of subsequent projects, the cumulative total cost of which exceeds \$25,000, will be forwarded for approval by the War Department as specified in (3) above.

b. **MAINTENANCE AND REPAIR, RELOCATION OR REMOVAL OF PASSIVE PROTECTION PROJECTS.** Maintenance and repair of existing buildings, structures, utilities, grounds, or other real property and the relocation or removal of passive protection measures which have not been declared surplus by the War Department, subject to War Department construction and maintenance policies.

(1) *Estimated cost of \$1,000 or less.* Class I, II, III, and IV installations—Post commanders.

(2) *Estimated cost of \$10,000 or less* (other than those approved in (1) above). (a) Class I, II, and IV installations—Commanding generals of service commands.

(b) Class III installations—Commanding generals of AAF commands or subcommands after technical review by the service command engineer

of the appropriate service command as provided in *e* below.

(3) *Estimated to cost in excess of \$10,000.* (a) Class I, II, and IV installations—Chief of Engineers acting for Commanding General, Army Service Forces.

(b) Class III installations—Commanding General, Army Air Forces, after technical review by the Chief of Engineers as provided in *e* below.

c. ALTERATIONS, ADDITIONS, EXTENSIONS, AND RECONSTRUCTION PROJECTS. Alterations, additions, and extensions to existing buildings, structures, utilities, grounds, or other real property and reconstruction of real property damaged or destroyed by fire, storm, etc., subject to War Department construction policies.

(1) *Estimated cost of \$1,000 or less* (except as provided in (4) below). Class I, II, III, and IV installations—Post commanders.

(2) *Estimated cost of \$10,000 or less* (other than those approved in (1) above, and except as provided in (4) below). (a) Class I, II, and IV installations—Commanding generals of service commands.

(b) Class III installations—Commanding generals of appropriate AAF commands after technical review by the service command engineer of the appropriate service command as provided in *e* below.

(3) *Estimated cost of \$20,000 or less* (other than those approved in (1) and (2) above, and except as provided in (4) below). (a) Class I, II, and IV installations—Commanding General, Army Service Forces (Mobilization Division) after technical review by the Chief of Engineers.

(b) Class III installations—Commanding General, Army Air Forces, after technical review of the Chief of Engineers as provided in *e* below.

(4) Any project estimated cost in excess of \$20,000, or any project involving permanent type construction estimated to cost in excess of \$1,000, or any project which is a portion of a program consisting of a series of similar projects at one or more installations or which will require prosecution of subsequent projects, the cumulative total cost of which exceeds \$20,000, will be forwarded for approval by the War Department as specified in *a*(3) above.

d. REMOVAL OF PASSIVE PROTECTION MEASURES WHICH HAVE BEEN DECLARED SURPLUS

BY THE WAR DEPARTMENT AND RESTORATION OF LEASED FACILITIES REGARDLESS OF ESTIMATED COST. The Chief of Engineers.

e. REVIEW OF PROJECTS FOR CLASS III INSTALLATIONS. Commanders of class III installations will, in the case of all projects requiring approval by higher authority, forward the original documents to the next higher Army Air Forces command and, except in the case of new construction projects, will simultaneously transmit information copies of such documents to the service command engineer in the Army Service Forces service command in which the installation is located. With respect to all projects except those for new construction which the intermediate Army Air Forces command intends to approve, that command will request technical comments from the service command engineer. If the project requires approval of Headquarters, Army Air Forces, following the approval of the intermediate Army Air Forces command, it will be forwarded, together with comments of the service command engineer. Headquarters, Army Air Forces, in obtaining technical review of the project by the Chief of Engineers, will submit the project with comments of the service command engineer.

f. EXCEPTIONS FOR CLASS I, II, AND IV INSTALLATIONS. With respect to specific programs at class I, II, and IV command installations, the Chief of Engineers will take action without referring individual projects to the Commanding General, ASF, provided the program itself has been previously approved by the Commanding General, ASF. For example, programs such as those involving the installation of sprinklers or the increased maintenance of hospitals may be established and approved by the Mobilization Division, ASF, as an entire program.

g. PROJECTS PARTIALLY FINANCED BY OTHER THAN APPROPRIATED FUNDS. Projects to be partially financed with other than appropriated funds and in which repairs and utilities funds may be used for materials, labor, or equipment will be processed in accordance with this policy.

Note. The provisions of this policy do not apply to industrial facility projects. Such projects will be processed in accordance with WD Procurement Regulation 10.

h. EMERGENCY WORK. It is the intent of this policy to provide the post commander with ample

authority to meet an emergency requiring on-the-spot action; for example, the initiation of repair of fire or storm damage, lack of which would jeopardize persons or property or seriously interfere with military operations; or the provision of temporary facilities to meet an unexpected arrival of troops. Repairs and utilities work normally requiring the approval of higher authority may be authorized by the post commander within the limits of cost budgets and repairs and utilities funds available locally without such approval in an emergency which does not permit the obtaining of required authority. The post commander will forward an immediate report by teletype or telephone of all such emergency work so authorized and follow it with a properly prepared WD AGO Form 5-25 to the same authorities normally required to act on the project. This authority will not be abused by the initiation of projects when authorization can be obtained by letter, teletype, or telephone. All emergency projects must be accomplished in strict compliance with current regulations pertaining to construction work. In all possible instances, emergency technical guidance should be requested from service command engineers in order to prevent inferior and costly jobs use of improper materials and in order to prevent future expenditures for corrective measures.

1.64. Repairs and Utilities Projects

a. NEW WORK PROJECTS COSTING IN EXCESS OF \$200. An individual project estimate will be prepared by post engineers on WD AGO Form 5-25 for each repairs and utilities new work project estimated to cost in excess of \$200. Estimates will be prepared in accordance with instructions contained on WD AGO Form 5-26. WD AGO Forms 5-25 for projects estimated to cost \$1,000 or less will be approved by the commanding officer of the installation and will be filed and held available for inspection in the office of the post engineer performing the work.

b. ACCOUNTING. Individual cost ledger sheets will be maintained for each project for which an individual project estimate is prepared. If a project is chargeable to more than one established repairs and utilities cost account, individual ledger sheets will be maintained for the work chargeable to each account with adequate cross-refer-

ence to permit ready determination of the entire cost of the project.

c. REPORTING. The post engineer will prepare a monthly report of approved repairs and utilities new work projects estimated to cost in excess of \$200, and of approved repairs and utilities maintenance and repair projects estimated to cost in excess of \$1,000. This report will be prepared on WD AGO Form 5-66 (Reports Control Symbol EUG-80), and will be submitted in duplicate to the commanding general of the service command (for class I, II, and IV installations) or to the commanding general of the air force or command (for class III installations) not later than the fifteenth of the month following the period for which the report is prepared. A separate report will be submitted for each installation classified as a main post for cost accounting and reporting purposes. Each such report will include projects approved for subposts and off-post facilities assigned to the main post for repairs and utilities purposes. Service commands and air forces and commands will review WD AGO Forms 5-66 submitted to them and take necessary action to assure—

(1) Limitation of work within the spirit and intent of paragraph 2.1.

(2) Expeditious completion of approved projects.

(3) Completion of projects at a cost not to exceed approved estimates.

(4) Projects are not initiated that will require implementation by subsequent projects, the cumulative cost of which is more than \$1,000.

d. NEW WORK PROJECTS AT LEASED PREMISES. An individual project estimate will be prepared by post engineers on WD AGO Form 5-25 for all new work projects at leased facilities irrespective of amount. In the case of new work projects at leased facilities estimated to cost less than \$1,000, the following certificate will be executed thereon by the post commander:

I hereby certify that the proposed work is: (1) within the terms of the lease; (2) not in violation of the provisions of section 322 of the act of 30 June 1932 (47 Stat. 412), or a certificate has been obtained as required by Public Law 530, act of 28 April 1942, 77th Congress (56 Stat. 247); (3) according to current directives on construction policy of the War Department; and (4) for the best interests of the Government.

e. DEFINITIONS. *Cost* as used in this policy

will be as defined in paragraph 1.65. New work is defined to include additions and alterations to and deletions from existing facilities, new construction, and restorations necessitated by disaster.

1.65. Cost of Repairs and Utilities Projects

The authority for the accomplishment of repairs and utilities work, including the installation of repairs and utilities equipment, is based upon the monetary limits set forth in AR 100-80. The availability of equipment, supplies and labor does not in itself constitute authority for accomplishment of work or installation of equipment. The cost (or value) of such items will be considered in determining approval authority even though acquired at no cost to the Government. The estimated cost will include the cost (or value) of all labor and repairs and utilities materials, plus the cost (or value) of repairs and utilities equipment to be installed. The cost of centrally procured and excess repairs and utilities items will be included in the total cost. The term *repairs and utilities equipment* as used herein includes that equipment or property which after installation, will be carried on the repairs and utilities real or installed property records, and equipment, mess (as defined in paragraph 4.26); but does not include property received on memorandum receipt, materials, equipment, repair parts, etc., furnished by another agency for performance of work by post engineer under the combined-shop plan, or such materials, supplies, and equipment as office supplies and equipment, flashlight batteries, certain insecticides, and gas masks, assigned to other technical services for procurement and not chargeable to repairs and utilities funds; except that the cost of property is recorded when property normally procured with repairs and utilities funds is obtained from other services for use in repairs and utilities work. Individual project estimates will include the cost of all repairs and utilities items necessary for the project, including both items for which additional funds are required, and items which are available at no additional cost to the station. Cost shown on the transfer document, or estimated fair value of materials and equipment supplied without transfer of funds from centrally procured, excess stocks, or other sources, will be included. Also to be included are items available in stock which are above author-

ized levels and will not need to be replaced if used.

1.66. Projects Requiring Requisitioning of Equipment or Materials

Approval for the installation of equipment or accomplishment of work estimated to cost in excess of \$1,000, will be obtained prior to, or in conjunction with, the submission of a requisition. Where prior approval has been obtained, such authorization will be cited on the requisition. To expedite action, a requisition for the items may be submitted along with the Individual Project Estimate. The project estimate and requisition will be forwarded to the service command by class I, II, and IV installations for processing in accordance with AR 100-80, and to the appropriate air force or command by class III installations for processing in accordance with WD Circular 388, 1944. After approval of the project by the air force or command, the requisition will be forwarded with appropriate remarks to the service command concerned. No action will be taken to supply the items listed on the requisition until the project estimate has been approved.

1.67. Approval of Conversions

Conversions to buildings and structures which effect their use or capacity will not be considered in a class distinct from other physical alterations to the building or structure except by specific instructions of the major command having jurisdiction. In the absence of such instructions, conversions will be approved under the policy in paragraph 1.63.

1.68. Subscriptions to Periodicals

a. GENERAL. Within the monetary limitations prescribed in c below, post engineers are authorized to utilize repairs and facilities funds available locally to subscribe to periodicals which will help them carry out their assigned mission.

b. DEFINITION. For the purpose of this policy, periodicals are publications published at stated intervals which treat the technical subjects of maintenance and repair of buildings, structures, and grounds, and maintenance repair, and operation of utility systems. Books, newspapers, publications not defined as periodicals, and pub-

lications received through membership in organizations are not authorized under this policy.

c. FUNDS. Subscriptions to periodicals will normally be for 1 year. Locally available repairs and utilities funds will be used and payment may be made in advance in accordance with the act approved 12 June 1930, 46 Stat. 508. (See 23 Comp. Gen. 326.) The amount which a post engineer may spend depends on the size class of his post as indicated below:

<i>Class of post</i>	<i>Maximum amount</i>
I through 5	\$100
6	75
7	50
8 and 9	25

Classification of posts is based on enlisted men housing capacities:

Class 1, over 58,000
Class 2, 38,000-58,000
Class 3, 24,000-38,000
Class 4, 12,000-24,000
Class 5, 6,000-12,000
Class 6, 3,000-6,000
Class 7, 1,500-3,000
Class 8, 500-1,500
Class 9, under 500

d. SELECTION OF PERIODICALS. No approved list of publications is prescribed, the following list being furnished only as a guide. The list is in two parts: part I contains periodicals on subjects of general interest; part II those on subjects of interest only in certain locations.

PART I

<i>Title</i>	<i>Publisher</i>	<i>Price</i>
Architectural Record.....	F. W. Dodge Corporation 115 W. 40th St., New York, N. Y.	\$3.00
Building Supply News.....	Industrial Publications, Inc. 59 E. Van Buren St., Chicago, Ill.	3.00
Engineering News Record....	McGraw-Hill Book Company, Inc. 330 W. 42d St., New York, N. Y.	5.00
Roads and Streets.....	Gillette Publishing Company 330 S. Wells St., Chicago, Ill.	3.00
The American City.....	American City Magazine Company 470 7th Avenue, New York, N. Y.	2.00
American Artisan.....	Keeney Publishing Company 6 N. Michigan Avenue, Chicago, Ill.	2.00
Power Plant Engineering.....	Technical Publishing Company 53 W. Jackson Blvd., Chicago, Ill.	2.00
General Electric Review.....	General Electric Company Schenectady, N. Y.	3.00
Air Conditioning and Re- frigeration News.....	Business News Publishing Company 5229 Cass Avenue, Detroit, Mich.	4.00
Fire Engineering.....	Case-Sheppard-Mann Publishing Co. 24 W. 40th Street, New York, N. Y.	2.00
Combustion	Combustion Publishing Company, Inc. 200 Madison Avenue, New York, N. Y.	2.00
Power	McGraw-Hill Book Company, Inc. 330 W. 42d Street, New York, N. Y.	3.00
Heating and Ventilating.....	Industrial Press 148 Lafayette Street, New York, N. Y.	2.00
Heating, Piping and Air Conditioning	Keeney Publishing Company 6 N. Michigan Avenue, Chicago, Ill.	2.00

<i>Title</i>	<i>Publisher</i>	<i>Price</i>
Sewage Works Engineering...	Case-Shepperd-Mann Publishing Co. 24 W. 40th Street, New York, N. Y.	\$2.00
Sewage Works Journal.....	Federation of Sewage Works Associations W. H. Wisely, Box 18, Urbana, Ill.	5.00
Water Works Engineering....	Case-Shepperd-Mann Publishing Co. 24 W. 40th Street, New York, N. Y.	2.00
Water Works and Sewerage...	Gillette Publishing Company 330 S. Wells Street, Chicago, Ill.	2.00
Public Works.....	Public Works Journal Corporation 310 E. 45th Street, New York, N. Y.	3.00
Electric Light and Power.....	Electrical Publications, Inc. 360 N. Michigan Avenue, Chicago, Ill.	5.00
Products and Priorities.....	Supt. of Documents, GPO, Washington, D. C.	2.00

PART II

<i>Title</i>	<i>Publisher</i>	<i>Price</i>
American Builder and Building Age.....	Simons-Bordman Publishing Corporation 10 Adams Street, Chicago, Ill.	\$2.00
American Roofer.....	Harris-Fox-Hoffman Publishing Corp. 426 4th Avenue, New York, N. Y.	2.00
Building, Standard Monthly..	R. C. Collins & Association 124 W. 4th Street, Los Angeles, Calif.	1.50
Concrete Builder.....	Portland Cement Association Chicago, Ill.	free
Contractors and Engineers....	Buttenheim-Dix Publishing Co. 470 Fourth Avenue, New York, N. Y.	2.00
Pacific Builder and Engineer..	Pacific Builder & Engineer Publication 3102-4 Arcade Square, Seattle, Wash.	2.00
Pencil Points.....	Reihold Publishing Company East Stroudsburg, Penn.	3.00
Municipal Engineer's Journal..	Municipal Engineers of the City of N. Y. 29 W. 39th Street, New York, N. Y.	2.00
Civil Engineering.....	American Society of Civil Engineers 33 W. 39th Street, New York, N. Y.	5.00
Westinghouse Engineer.....	Westinghouse Electric and Mechanical Co. East Pittsburg, Penn.	3.00
American Gas Journal.....	American Gas Journal, Inc. Dodge Bldg., 53 Park Place, New York, N. Y.	2.00
Butane Propane News.....	Western Business Papers, Inc. 1709 W. 8th Street, Los Angeles, Calif.	2.50 (3 yr.)
Journal of American Water Works Association.....	American Water Works Association 22 E. 40th Street, New York, N. Y.	7.00
Public Management.....	International City Managers Association 1313 E. 60th Street, Chicago, Ill.	4.00

I.69. Publications for Preventive Maintenance Program

It is of utmost importance that post engineers have readily available the necessary publications

(Technical Manuals, Technical Bulletins, Lubrication Orders, etc.) for use in the preventive maintenance program.

a. OFFICIAL WAR DEPARTMENT PUBLICATIONS.

All official War Department TM's, TB's, and TB ENG's may be obtained upon requisition from the appropriate Adjutant General depot in accordance with AR 310-200. All completed official War Department TM's, TB's, and TB ENG's are listed in FM 21-6 (at present published quarterly), and it may be determined prior to requisitioning whether or not an official War Department publication for any specific item of equipment has been issued by referring to the appropriate listing.

b. NONOFFICIAL WAR DEPARTMENT PUBLICATIONS. Certain nonofficial War Department TM's are listed in FM 21-6 and are designated by a small double-dagger placed before the listing. In these cases, the TM's listed may be obtained direct upon requisition from the Commandant, Engineer School, Ft. Belvoir, Va. These manuals are unofficial manufacturers' manuals that have been assigned numbers.

c. MANUFACTURERS' INFORMAL MANUALS. Manufacturers' informal manuals for all non-standard equipment, lubrication orders, and preventive maintenance service manuals may be obtained upon requisition from the Commandant, Engineer School, Ft. Belvoir, Va. It is understood that The Engineer School plans to stock manufacturers' manuals for all items of engineer equipment where the need will justify the cost. To avoid delay in obtaining these publications, it is necessary that the proper nomenclature of the item of equipment for which the publications are desired, together with a complete description showing make, model, year of manufacture, serial number and make, model and engine number be furnished with all requisitions for manuals, lubrication orders, and PM services.

1.70. Numbering Buildings

Buildings will be numbered in accordance with AR 100-70 and TM 5-601 (when published). Building numbers will be assigned by the post commander or by the resident engineer if there is no post commander. Original numbers will be retained as a permanent record and will not be changed without approval of the post commander.

1.71. Post Engineer Cost Accounting

a. AUTHORITY. Post engineers will maintain

cost accounts on their repairs and utilities activities in accordance with TM 5-602. Costs for all installations will be reflected either in the report of a main post or subpost or as an off-post facility.

b. REPAIRS AND UTILITIES COST CARDS. Reports will be submitted monthly by all posts assigned repairs and utilities cost-reporting station numbers. Repairs and utilities cost cards (control approval symbol EEP-61), prepunched with the station number, will be used as the report form. Cards will be sent to OCE, Repairs and Utilities Branch, Washington 25, D. C., Attn.: SPEUG, and will be mailed by the 7th of the month following the report period. The post engineer will obtain directly from OCE by requisition submitted in duplicate. Requests for new station numbers and initial supplies of cards will be approved by the service command engineer. The notice of assignment of a station number is forwarded to the service command engineer and supply of cards shipped directly to the post engineer. IBM electrographic pencils for marking cost cards will be requisitioned from the service command engineer.

c. INACTIVE AND TRANSFERRED STATIONS. Cost reports will be submitted for an inactive installation until it is declared surplus and accountability is transferred to the Corps of Engineers. If maintenance responsibilities for an inactive installation are assigned to the post engineer of a nearby active post and separate cost reports for the inactive station are not advisable, costs may be transferred to and reported in the active station's 631 or 632 accounts. Cost reports will be submitted for installations transferred to the Navy Department or other agencies until all costs incurred from ESA funds, including terminal leave of civilian employees, have been recorded and until zero balances are reflected in the following reconciliation accounts: all inventory accounts; account 683-10, Accounts Payable; account 684-00, Unexpended Allotments; account 698-10, Accounts Payable—Materials, Supplies, and Nonpersonal Services; and account 698-20, Accounts Payable—Pay Rolls. Cost reports will be submitted when the post engineer does repairs and utilities work for the Navy Department or other agencies on a reimbursable basis.

1.72. Repairs and Utilities Consolidated Reports and Operation Logs

The Chief of Engineers is responsible for issuing instructions to implement the policy on consolidated reports and operating logs.

a. **FORMS USED.** Reports of repairs and utilities activities at posts, camps, and stations in the continental United States will be submitted on the forms listed below. Instructions for preparing these reports are printed on the backs of the forms. Stocks of forms are available on requisition from Adjutant General depots for class I, II, and IV installations and from air technical service command depots for class III installations.

(1) WD AGO Form 5-55 (Repairs and Utilities Consolidated Report—Operating Data), Reports Control Symbol EMU-69, will be submitted monthly by all stations indicated in *d*(1) below.

(2) WD AGO Form 5-56 (Repairs and Utilities Consolidated Report—Operating Data), Reports Control Symbol EMU-69, will be submitted quarterly by all stations indicated in *d*(1) below.

(3) WD AGO Form 5-57 (Repairs and Utilities Consolidated Report—Basic Data), Reports Control Symbol EMU-70, will be submitted semiannually by all stations indicated in *d*(1) below.

(4) WD AGO Form 5-58 (Water Operating Log), Reports Control Symbol EMU-67, will be submitted monthly by all stations indicated in *d*(1) below, including those purchasing water.

(5) WD AGO Form 5-59 (Water Operating Log), Reports Control Symbol EMU-67, will be submitted monthly as a supplement to WD AGO Form 5-58 by stations operating water filtration plants.

(6) WD AGO Form 5-60 (Sewage Operating Log), Reports Control Symbol EMU-68, will be submitted monthly by all stations operating sewage treatment plants.

(7) WD AGO Form 5-61 (Sewage Operating Log), Reports Control Symbol EMU-68, will be submitted monthly as a supplement to WD AGO Form 5-60 at those stations with separate sludge digestion, chlorination, or aeration processes, or where analysis of suspended solids, biochemical-oxygen demand, or stream condition is required.

(8) WD AGO Form 5-97 (Boiler Water Treatment Log), Reports Control Symbol EMU-

79, will be submitted monthly as a supplement to WD AGO Form 5-55 by all stations as an operating log for the control of boiler water treatment in steam boilers operating in excess of 15 pounds pressure.

(9) WD AGO Form 5-98 (Boiler Plant Operating Log), Reports Control Symbol EMU-83, will be submitted monthly as a supplement to WD AGO Form 5-55 by all stations as an operating log for central boiler plants.

b. **CHANNELS FOR SUBMITTING FORMS.** (1) *Consolidated reports.* WD AGO Forms 5-55, 5-56, and 5-57 will be prepared in triplicate at class I, II, and IV installations and in quadruplicate at class III installations. One copy will be kept at the post. The original and one copy will be forwarded by class I, II, and IV stations to the commanding general of the service command and by class III stations to the commanding general of the air force or AAF command, to reach those offices by the 10th of the month following the report period. The post commander will forward an information copy of reports for class III installations directly to the commanding general of the service command for technical review and comment. It will be the responsibility of the commanding general of the service command, air force, or AAF command to insure that reports are submitted by each reporting station on dates prescribed herein, and that the data reported thereon are correct. After the reports are reviewed for correctness, the copy will be withdrawn and the corrected original forwarded to OCE, attention the Repairs and Utilities Division, to reach that office by the following dates:

(a) WD AGO Forms 5-55 and 5-56 will be forwarded to arrive by the 25th of the month following the period reported.

(b) WD AGO Form 5-57 for the period ending 30 June will be forwarded to arrive by 25 August and report for period ending 31 December will be forwarded to arrive by 25 February.

(2) *Operating logs.* WD AGO Forms 5-58 through 5-61, 5-97, and 5-98 will be prepared in duplicate at class I, II, and IV stations and in triplicate at class III stations.

c. Letters of transmittal are not required for consolidated reports or operating logs. They will not be classified.

d. **BASIS FOR SUBMITTING FORMS.** (1) *Consolidated reports.* WD AGO Forms 5-55, 5-56,

and 5-57 will be submitted by each station assigned a repairs and utilities cost reporting station number. In cases where post engineers have been assigned repairs and utilities responsibilities for minor off-post facilities, a separate consolidated report will be submitted, which will reflect the summation of data for all Government-owned and leased facilities, the costs of which are reported in the account codes 631-00 and 632-00 of the repairs and utilities cost report for the main post. Waste disposal data are not required for minor off-post facilities reports. In no case will more than two operating reports be submitted for a main post assigned a cost reporting station number.

(2) *Water and sewage operating logs.* WD AGO Forms 5-58 through 5-61, 5-97, and 5-98 will be submitted as applicable, dependent on the utilities plant facilities at the post. (See *a* above.)

e. REPORTS ON PURCHASED ELECTRIC ENERGY. All class I, II, III, and IV installations will submit to the commanding general of the service command, attention the Electrical Section, Office of the Service Command Engineer, a copy of the delivery order covering payment of purchased electrical energy. This delivery order will be a copy of the billing from the utility contractor and will be mailed within 3 days of its receipt. No copies of these orders will be submitted to OCE.

1.73. Reports of Damage to Public Property

a. SUBMISSION OF REPORT. In the cases of damages or destruction outlined in *b* below, report in triplicate will be prepared within 48 hours of the damage or destruction on WD AGO Form 3-2 (Individual Damage Report), Reports Control Symbol EUG-81, by the post commander. Where complete information for preparing the report is not available within that time, the report will nevertheless be made on the basis of available data and a supplemental report submitted as soon as possible thereafter. One copy will be retained at the post, camp, or station preparing the report. The original and one copy will be submitted to the commanding general of the service command, who will retain the original for information and necessary action and immediately forward the copy to the Chief of Engineers with

appropriate notes or comments thereon. Additional copies of the report, as directed by the Commanding General, AAF, will be forwarded by class III installations through command channels to the Commanding General, AAF.

b. WHEN REPORTS ARE REQUIRED. Reports are required under this policy under the following conditions:

(1) Whenever a building, or other type of structure, utility plant, system, installed equipment, or War Department materials, supplies, or equipment, other than aircraft, are destroyed or damaged by any one of, or combination of, the following:

(a) Fire.

(b) Explosion.

(c) Accident (other than fair wear and tear) where the total estimated damage exceeds \$1,000 exclusive of materials, supplies, or noninstalled equipment.

(d) Wind, storm, flood, or other act of God, where the total estimated damage exceeds \$1,000 exclusive of materials, supplies, or noninstalled equipment.

(2) When such building, or other type of structure, utility plant, system, installed equipment, or War Department materials, supplies, or equipment, other than aircraft, are located on land-owned or leased by the Government and under control of the War Department.

c. PROPERTY ACCOUNTABILITY AND FINANCIAL RESPONSIBILITY. Matters of property accountability and financial responsibility in connection with destruction or damage to building, or other type of structure, utility plant, system, installed equipment, or War Department materials, supplies, or equipment, are not within the scope of reports required by this policy, and submission of the required report will not be withheld pending the result of property accountability and financial responsibility investigations. For the appropriate procedure regarding these matters, see AR 25-20, 25-220, 35-6620, and 35-6640.

d. DAMAGE OR DESTRUCTION OF AIRCRAFT. Reports of damage or destruction of aircraft will be submitted in accordance with established War Department directives, whenever a post fire department has responded to a call involving damage or destruction of aircraft.

CHAPTER 2

BUILDINGS AND STRUCTURES

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. General	2.1-2.6	32
II. Components of buildings	2.7-2.26	36
III. Housing and quarters	2.27-2.33	42
IV. Leased premises	2.34-2.39	46
V. Special-purpose buildings and structures	2.40-2.51	50
VI. Fortifications	2.52-2.61	54

CHAPTER 2

BUILDINGS AND STRUCTURES

Section I. GENERAL

2.1. Application of Construction Policy to Maintenance and Repair

a. USE OF CRITICAL MATERIALS. The rescission of the Army-Navy Munitions Board (ANMB) list of prohibited items for construction work will not be interpreted to mean that the principles of economy in the use of materials and the policy of minimum construction are to be discontinued. The policy enumerated in *b* below, will continue in effect on all military construction and maintenance operations. Within the limits established by minimum requirements or established standards continued attention will be given to the use of such materials or grades of materials and to types of construction as will result in the lowest initial cost and completion within scheduled dates commensurate with quality satisfactory for adequate and economical maintenance and operation.

b. ECONOMY IN CONSTRUCTION AND MAINTENANCE. In order to limit expenditures for new construction, addition, extension, alteration, improvement, repair, maintenance, or other work accomplished on real property, installed equipment, and other facilities, owned, leased, controlled, or sponsored by the War Department, to the absolute minimum consistent with the proper and efficient operation of the military establishment, and to provide a comprehensive policy governing all new construction and repairs and utilities projects, the criteria herein are established. In order to reduce expenditures for, and minimize scope of, repairs and replacements preventive maintenance of real property and installed equipment will be vigorously prosecuted at all military establishments. Nothing will be done merely because it contributes to beauty, convenience, comfort, or prestige, unless specific excep-

tion is granted by the War Department. No new construction, addition, extension, alteration, improvement, repair, maintenance, or other work will be accomplished with appropriated or nonappropriated funds on real property, installed equipment, and other facilities which are owned, sponsored, or controlled by the War Department unless—

(1) It is directly and vitally necessary to the proper performance of the mission of the installation. In determining essentiality, consideration will be given to the designated mission of the installation concerned, and the length of time this mission will continue.

(2) It results in an increase in efficiency of functional utilization or reduction in costs through savings in maintenance and operation. Based on the planned occupancy or utilization of the installation, such costs will be amortized by savings realized during the minimum normal life of usefulness.

(3) The cost of projects will be held to a minimum by simplicity of design, and by the minimum standards of durability required to meet existing or known needs of the installation and commensurate with quality satisfactory for adequate and economical maintenance and operation.

2.2. Salvage and Re-erection of Buildings

a. PUBLIC BUILDINGS OR IMPROVEMENTS. Permanent or temporary public buildings or improvements other than fortification elements which fall within one of the classifications below may be salvaged or sold without following the procedure for disposition of surplus facilities:

(1) Buildings or improvements damaged or unsuitable for public service.

(2) Buildings or improvements which cannot be kept in repair at reasonable cost.

(3) Buildings or improvements dangerous to life, likely to damage adjoining structures, or which have become hazards or nuisances.

(4) Buildings or improvements which occupy or interfere with sites needed for new construction or for other military purposes.

(5) Buildings or improvements which interfere with efficient operation of the project.

(6) Buildings or improvements needed at other sites or containing materials needed by War Department.

Such structures will be placed on a Report of Survey (WD AGO Form 15), which will be submitted for approval in accordance with section III, WD Circular 195, 1944. When it is proposed to remove buildings at class I, II, or IV installations in excess of 5 percent of the gross housing at any one installation in a 12-month period under the above procedure, the proposed plan will be referred to the Commanding General, ASF, Attn: Director, Mobilization Division, for review and approval prior to initiation of actual removal. At class III installations, the Report of Survey will be forwarded by the commanding officer of the installation to the Commanding General, AAF, through channels, for further action; except that when the "in-place" value of the improvement is \$500 or less and the Government will benefit by disposing of the building, the commanding officer may take final action.

b. SALVAGED MATERIALS. Salvaged building materials may be shipped to another station on approval of the service command engineer.

c. MOVING, DISMANTLING, AND RE-ERECTION OF BUILDINGS. Authority for moving a building intact to a new location (either on the same post or on another post) or for the dismantling and re-erection in a new location (either on the same post or on another post) of buildings or structures will be obtained as for new construction. Under the provisions of paragraph 1.14, repairs and utilities funds may be used for such work when the total estimated cost of the project is \$1,000 or less. In determining the total estimated cost of the project, the following rules will apply:

(1) The value of buildings and structures to be moved intact from one location to another on the same post *will* be included in the total esti-

mated cost of the project, but *will not* be recorded in the repairs and utilities cost accounts.

(2) The value of buildings and structures to be moved intact from one post to another post *will* be included in the total estimated cost of the project and *will* be included in the repairs and utilities cost accounts.

(3) The value of component parts of buildings and structures to be dismantled and re-erected either on the same post or on another post *will* be included in the total estimated cost of the project and *will* be included in the repairs and utilities cost accounts.

2.3. Reservation Boundaries

Reservation boundaries will be surveyed, marked or fenced only when specifically authorized. Requests for expenditure of funds for such work will not be approved unless justified by exceptional circumstances, explained in detail. Simple inexpensive signs, blazed trails within the reservation along property lines through wooded areas, or other similar inexpensive methods should suffice to enable troop commanders to identify reservation boundaries. Boundary surveys may be authorized as part of the training program for troops when the work can be fitted into the training program. Post engineer participation will be limited generally to supplying necessary stakes and corner markers and lending necessary tools or equipment. Three copies each of the maps and metes and bounds description will be furnished for OCE records.

2.4. Maintaining Inactive Installations

Inactive installations are Government-owned and/or War Department-operated command and industrial installations which have been so designated and placed in stand-by, excess, or surplus status.

a. SCOPE. Because of the variety of installations which may become partially or completely inactive and the diversity of conditions by which they may be influenced, there is a wide range in the degree of maintenance and protection required and the procedure to be followed. Authorized procedure may range from assignment to the nearest post engineer, locking the door, and notifying local police and fire departments, to continuing or establishing a complete full-time post

engineer maintenance organization. Those in charge of maintenance in the field will determine the exact procedure for each specific case, based on—

- (1) Nature of the facility.
- (2) Location, local climate, and weather conditions.
- (3) Probable duration of designated status.
- (4) Time and funds required for various possible degrees of maintenance and protection; consideration should be given to the corresponding time and funds which will be needed if and when reactivation is directed.
- (5) Availability of maintenance personnel.
- (6) Probable frequency and comprehensiveness of inspections.
- (7) Recommendations of manufacturers and builders.

b. PRINCIPLES. The following general principles will govern determination of work to be done in deactivating and maintaining all or part of an installation:

- (1) Only work considered essential or amply justified will be undertaken.
- (2) The installation will be kept in satisfactory physical condition. Materials and methods used will be similar to those employed in the original construction.

c. RESPONSIBILITY. Inactive and partially deactivated installations will be maintained by post engineers or by contract under direction of post engineers. If it is more economical, maintenance of two or more inactive or partially deactivated installations may be assigned to the same post engineer. His duties will include:

- (1) Maintenance and protection of the property to conserve its value.
- (2) Prudent management to accomplish maintenance with maximum efficiency and minimum expenditure of manpower, materials, and funds.

d. RECORDS. For use during maintenance of inactive and partially deactivated installations and to facilitate reactivation, complete records will be maintained of all buildings, structures, utilities, equipment, and machinery which are deactivated, and of all actions taken during and after deactivation.

e. HOUSING FOR MAINTENANCE PERSONNEL. Only the simplest provisions consistent with proper standards of safety, health, and sanitation will be made for maintenance personnel or others

stationed at an inactive installation or a deactivated part of an installation; this includes such facilities as water supply, sewage disposal, waste disposal, heating, lighting, and refrigeration. For some of these facilities, the critical factor may be a consideration such as fire protection rather than requirements of personnel.

f. FUNDS. The cost of maintaining and guarding inactive Government-owned installations will be met from funds available for disposal of surplus facilities, unless otherwise provided in this manual or in directives on specific installations. The cost of guarding vacated leased installations pending return of the property to its owners will be charged to repair and utilities funds.

2.5. Disposition of National Guard Training Camps

Upon the discontinuance of former National Guard facilities, improvements of all types, including such equipment as cooking ranges, water heaters, water purification equipment, ventilation equipment, heavy plumbing, electric motors, fire-fighting equipment, and similar items for the improvement of camp utilities, together with gasoline dispensing pumps and gasoline tanks, will remain intact on the installations, except in cases where the Chief of Engineers certifies that their use is necessary to the more efficient operation of active training installations. Upon the return of State-owned facilities to the States, federally-installed improvements will be offered for sale to the States, or be left in lieu of restoration. In either case, and where practicable, recapture clauses will be imposed to secure such improvements for future Federal use; or, in instances where the States are unable or unwilling to pay for the federally-installed improvement, the War Department will issue revocable use permits to the States without reimbursement, but with the States assuming the obligation of maintenance. On installations owned by the War Department and placed at the services of the State, under National Guard Bureau supervision, a similar procedure will be followed, except that all of the property will remain in the ownership of the War Department. In these cases the Chief of Engineers will issue a permit for State use of the entire installation without reimbursement but with the State assuming the obligation of maintenance.

2.6. Permanent and Temporary Buildings

a. PERMANENT BUILDINGS. Permanent buildings as used in this manual are defined to include:

(1) War Department-owned structures constructed prior to the beginning of the Limited National Emergency, 8 September, 1939 (WD Bull. 18, 1939).

(2) War Department-owned structures constructed after the beginning of the Limited National Emergency, with funds appropriated specifically for projects designated as being permanent in nature.

(3) Structures purchased by the War Department.

(4) War Department leased structures.

b. TEMPORARY BUILDINGS. All buildings and structures not included in the above classes will be considered as temporary buildings. Principally, this group will include the mobilization and theater of operations buildings, either modified or unmodified, constructed after the declaration of the Limited National Emergency.

Note. The definitions above have no reference to or connection with what is termed a "permanent post."

Section II. COMPONENTS OF BUILDINGS

2.7. Theater of Operations Buildings

Theater of operations type construction is designed to provide temporary housing with minimum use of materials and labor. Therefore, frequent repairs and constant attention to snow removal are to be expected. Inadequate framing may cause problems such as sagging roofs and bulging walls in buildings constructed from TO 11.41-series plans. Minimum adequate framing for these buildings is shown on drawing No. TO 11.41M, sheet No. 3; details shown on this drawing will be followed generally in making corrections to existing structures. Completely rebuilding or reroofing existing theater of operations type buildings is not considered necessary unless the structure is in danger of imminent failure. Roofs and walls which sag or bulge slightly are not necessarily in danger of failure; poor appearance alone should not be considered a basis for rebuilding.

2.8. Roof Trusses

At all posts, camps, and stations competent engineering personnel will periodically inspect timber trusses in all buildings except those of simple rafter construction. Theaters, gymnasiums, recreation buildings, and other assembly buildings will be given first priority in inspection and repair. Service command engineers will furnish technical assistance to installations needing it.

a. **INSPECTIONS.** Inspections will include trusses, structural posts and columns, and truss, wall, and column bracing. The procedure will be as follows:

(1) Check plans from which trusses were fabricated to determine whether proper number and size of members, splice plates, bolts, and timber connectors were used.

(2) Inspect condition of timber for critical defects such as longitudinal splits or checks; large face knots or deep edge knots, particularly in tension members; and timber with grain not parallel to axis of members.

b. **CORRECTIVE MEASURES.** *Immediate* action will be taken to correct defects which might lead to failure. *Major* repairs will not be undertaken at posts which are now deactivated.

2.9. Roof Repairs

In general, roof repairs and reroofing will follow methods outlined in TM 5-617.

2.10. Stacks, Roof Jacks, and Outside Breechings

Stacks, roof jacks, and outside breechings will be repaired or replaced with material used in their original construction if that has been satisfactory and if an appreciable over-all saving in cost may be indicated. For example, satisfactory performance for iron flues would be lack of evidence of serious corrosion within 3 years. This policy is particularly important if the facility may be used only for a limited time.

At posts using coal containing over 2 percent sulfur, especially those in the Fifth and Sixth Service Commands, many iron stacks and jacks will require replacement because of corrosion from chemically active flue-gas condensates. Frequent replacement is also necessary in seacoast locations subject to the corrosive action of salt air.

2.11. Canopies

Canopies will not normally be provided. They will be authorized over warehouse loading platforms at supply depots, air depots, and ports of embarkation *only* when severely adverse weather conditions cause marked decrease in operating efficiency. Requests for construction will be accompanied by full and complete justification. Weather can be considered severely adverse when:

a. Prevalent conditions of snow and ice along loading platforms require extensive and time-consuming removal or render operations hazardous.

b. Continuous rainfall interferes with efficient operations or causes substantial damage to supplies and equipment.

2.12. Entrance Vestibules

Entrance vestibules may be built only on hospital buildings, barracks, quarters, and administration buildings in the -20° zone where they are deemed necessary by the commanding general of

the service commands or commanding generals of air forces or AAF commands. Requests for construction of vestibules on other buildings and in other temperature zones will require complete justification.

2.13. Theater Exits

a. BUILDINGS AFFECTED. Two exits besides those provided by original plans will be added in all existing buildings of the following types which have not been altered:

(1) Training auditorium, type TA-AT, drawings TO 700-5825 to 5830, inclusive.

(2) Theater, type TH-3, drawings 700-1212 to 1224, inclusive.

(3) Theater, type TH-1038-P, drawings 800-486 to 498, inclusive.

(4) Theater, type TH-1038-S, drawings 800-500 to 514, inclusive.

b. ALTERATIONS. The additional exits will be approximately centered in each of the side walls. They will be the same width as those near the front of the building, and will have similar double doors, opening out. Stairs will be provided with handrails on both sides. Panic bolts will be provided for exit doors of all assembly buildings accommodating more than 100 occupants. Where necessary, two rows of seats will be removed to form a continuous aisle between the additional exits. Remaining seats should be fixed firmly to the floor.

2.14. Insulation

a. WHERE AUTHORIZED. (1) *Localities.* Insulation deficiencies may be corrected in all types of buildings in northern climates, within the limitations outlined in TM 5-613 (when published). Ordinarily, only stations in the 0° and -20° temperature zones should require insulation.

(2) *Buildings.* Insulation should be limited to buildings in the first, second, and third priority groups: hospital buildings used by patients and visitors; barracks and quarters; and administration buildings. In special cases, insulation may be approved for structures in other priority groups if, in the opinion of the commanding general of the service command, it is sufficiently justified.

b. INSTALLATION. For materials and installation methods, see TM 5-613.

2.15. Plumbing

a. TOILET FACILITIES. (1) *General.* Additional toilet fixtures may be installed only when conversion of existing facilities is impractical. Justification for each project will include the number of persons to be served and the location of existing toilet facilities. Generally, work areas should be within 600 feet of the nearest toilet room. For the number of fixtures required in a building, see TM 5-619 and the table below.

(2) *Warehouses and shops.* Existing toilet facilities in warehouses, shops, and similar buildings often require conversion because of the increasing employment of civilian women. The schedule in TM 5-619 for providing fixtures is amended for civilian occupancy as follows:

NUMBER OF EMPLOYEES PER FIXTURE

Employees	Water closets	Lavatories	Urinals
Male	20	20	40
Female	14	20	0

Wherever possible, toilet facilities should be provided women by assigning them a number of existing toilet rooms, rather than subdividing all toilet rooms into two separate compartments. The latter alternative may be necessary in cases where toilet facilities would otherwise be too far from employees. Toilet facilities may be further subdivided to provide for separation of white and Negro personnel.

(3) *Types of fixtures.* For types of fixtures to be installed, see TM 5-619. Deviation from this specification is *permissible* where facilities of a *temporary nature* are installed in buildings such as warehouses, shops, etc., which may be classified as temporary. Permissible variations include:

(a) Trough urinals with automatic high-flush tanks.

(b) Automatic high-flush tanks for urinals placed in batteries of three or more fixtures. One tank should be installed for each battery.

(c) Trough wash basins or other types of group lavatories.

b. DRINKING FOUNTAINS. The number of drinking fountains installed in a building is prescribed in TM 5-619. For sanitary reasons, installing them within toilet rooms should be avoided; however, those now installed in toilet rooms will not be relocated.

c. **WATER SUPPLY SYSTEM.** During all installation, alteration, repair, and inspection, all potable-water supply piping should be checked carefully for one of the potentially dangerous connections listed below. Dangerous cases will be corrected immediately, using protective measures prescribed in TM 5-619. Dangerous connections include:

(1) Interconnections between potable- and nonpotable-water lines.

(2) Fixtures with under-rim water supply connections that may become submerged in use of the fixture.

(3) Fixtures having over-rim supplies with inadequate air gaps.

d. **HOT-WATER SUPPLY SYSTEMS.** Hot-water supply systems should be provided in all buildings *equipped* with plumbing fixtures normally *equipped* with hot-water connections, where the occupational use definitely establishes the need for hot water. In warehouses, shops, and similar buildings where only a few lavatories are served or where lavatories are more than 200 feet apart, installation of hot-water supply systems may not be warranted. In such cases, alternate lay-outs or methods for providing hot water should be submitted for each project with justification based on local conditions.

e. **FLOOR DRAINS.** Floor drains should not be installed in locations where sewer gas may escape if drain traps are flushed infrequently. Precautions should be taken to insure that traps of existing floor drains are water-sealed at all times.

f. **GREASE INTERCEPTORS.** The post engineer is responsible for training mess personnel in proper maintenance of the grease interceptors installed in or near mess halls to collect grease from greasy wastes. For methods of removing grease and cleaning interceptors, see TM 5-619.

2.16. Painting

Strictest economy must be exercised in painting and repainting War Department-owned, leased, controlled, or sponsored buildings, structures, facilities, machinery, and equipment. Only the most urgently needed painting and repainting will be permitted.

a. **EXTERIOR PAINTING.** In theater of operations and mobilization type troop housing and appurtenant installations, painting and repainting will be limited to sash, doors, and trim. Wood

construction at Government-owned manufacturing plants may have one coat of creosote oil stain or cottonseed-oil gum stain, and doors, sash, and trim may be painted unless already stained. No other exterior painting will be permitted on posts unless specifically authorized by the Chief of Engineers at installations to be retained for post-war use, as determined by the War Department General Staff.

b. **INTERIOR PAINTING IN TEMPORARY BUILDINGS.** Interior painting is authorized in the following temporary buildings: hospital buildings used by patients; bakeries; cold storage rooms; service clubs; guest houses; exchanges; induction buildings; weather-forecasting rooms at base weather stations; air transport command passenger terminals; and Chemical Warfare Service and Ordnance Department plants, where necessary to reduce hazards resulting from handling and processing explosives and explosive and toxic gases.

(1) *Hospital buildings.* Hospital buildings used by patients include corridors constantly used by patients. In such cases, interior painting will be undertaken only with specific authority of OCE and will be held to a minimum; oil paints, rather than enamel, will be used. Painting the inside of such corridors will not be undertaken at all hospitals; it should be done only when a definite need has been established.

(2) *Kitchens and mess halls.* When whitewashing or painting kitchens, kitchen storerooms, and mess halls is considered necessary and approved by the commanding officer of the installation, the post engineer will supply the organization with materials and equipment. Repairs and utilities funds may be used for materials and equipment.

(3) *Exchanges.* Materials and labor for interior painting in exchanges will be paid for from nonappropriated funds; War Department funds will not be used for such projects.

c. **INTERIOR PAINTING IN PERMANENT BUILDINGS.** The need for painting or repainting should be determined on the individual merits of each case, depending on the use of the room, size and arrangement of windows, and existing wall finish. In addition to the painting permitted for temporary buildings, painting permanent buildings may be justified in the following instances:

(1) Where use requires a high degree of sani-

tation and where present condition falls below minimum set by post surgeon.

(2) Where conditions cause rapid deterioration of unprotected materials; for example, excessive water or condensation in shower and toilet rooms.

(3) In shops, offices, classrooms, etc., where difficult visual tasks require a degree of lighting which otherwise would have to be obtained by rewiring and/or installing additional or new lighting fixtures.

2.17. Floor Repairs and Covering

a. GENERAL. Frequently, coverings and top-pings are the cheapest and fastest means of floor repair. As substitutes for reflooring and extensive replacement, their use results in substantial savings in critical materials. A general program of improving existing floors should not be initiated unless specifically directed by OCE. Only floors definitely in need of repair should be improved, and then only when the planned future use of the building warrants it. Linoleum or other floor covering should be installed only after floors become unsanitary or dangerous. Floor covering should not be laid over wood floors less than 4 to 5 months old because warpage and shrinkage of the floor during this period will damage even floor covering installed over a suitable underlay. Ordinarily, wood floors should not constitute a hazard until after 9- to 12-months' use. Before installing floor covering, consideration should be given to the type of occupancy involved and to the wide variation between War Department construction standards and normal civilian standards. Covering hardwood or high-quality pine flooring is not contemplated. Appropriate corrective measures developed for areas and occupancies most often requiring work of this nature are outlined herein. For installation details, specifications, etc., see TM 5-616 (when published).

b. HOSPITALS. (1) Floor covering may be authorized in the following areas and under the conditions stated:

(a) All wards, clinics, infirmaries, surgery, X-ray, recreation buildings, and other buildings which are habitually used by patients and are finished with flat-grain pine, fir, or other low-grade wood flooring or concrete.

(b) Corridors (inclosed connecting walkways) and administration buildings.

(2) (a) Over wood construction, floor coverings should conform to Federal Specification LLL-F-471, amended 26 June 1943, grades A, B, or C, in roll form, or to $\frac{1}{8}$ -inch burlap backed linoleum conforming to Federal Specifications LLL-L-351a, battleship or LLL-L-367, Jaspe and marbelized. Use of grade A material is considered justified only in hospitals of the larger and more permanent type. To encourage adequate competition and secure a reasonable price, quotations in such cases must be obtained on grades B and C as well. In hospitals of less permanent type, use of grade A covering should be avoided. In southern portions of the continental United States, asphalt tile has given good service in many cases when properly applied over wood construction of suitable design and may be used under similar circumstances if specifically approved by the service command. Floor coverings over wood construction will be installed over a plywood underlay.

(b) Existing concrete floors on grade in the areas indicated in (1) above, will be covered with $\frac{1}{8}$ -inch asphalt tile, B group, conforming to Federal Specification SS-T-306. Concrete floors above grade may be covered with asphalt tile or linoleum of the appropriate type and grade. Installation and preparation of the undersurface will be in accordance with manufacturer's directions.

(3) To secure the benefits of competition, bids for floor-covering projects will be obtained and estimates made on the following:

(a) Material purchased by post or service command directly from manufacturer.

(b) Material purchased by post from dealer.

(c) Installation of delivered material by post labor.

(d) Installation of delivered material by contract.

(e) Material and installation by contract.

(4) Several of the lower grades of plywood are suitable for use as underlay in floor-covering projects. Instructions will be furnished from time to time on the most available grades and similar information.

c. HOSPITAL AND TROOP MESS HALLS. Concrete laid in accordance with TM 5-615 (when published) will withstand frequent wet scrubbing and resist wear and tear better than linoleum or other floor covering. Mess halls and similar build-

ings should be refloored as described in TM 5-615 with 1½-inch thick concrete topping if the existing wood-floor framing is sufficient.

d. GENERAL ADMINISTRATION BUILDINGS (ASPHALT COMPOSITION). Applying Mastipave, Armo-floor, or similar asphalt composition material laid in asphalt over a rough sanded wood floor results in a reasonably economical and satisfactory repair for administration and similar special buildings, except those in hospital areas. Indentation is a problem with this material but its ability to adapt itself to irregularities in the under floor compensates for this disadvantage. Use of higher type floor covering in these buildings normally is not authorized.

e. BARRACKS AND DAY ROOMS. When floors in barracks, day rooms, and similar buildings are in such poor condition that repairs are imperative, inexpensive floor-covering materials, such as Cantonment Flooring, Rubberlike, smooth-surface asphalt roll roofing, etc., may be used to good advantage. In these buildings, underlay or extensive preparation of the existing floor is not necessary. There is no specific designation of buildings in which these materials can be used. Requests will be considered individually.

f. WAREHOUSES AND SHOPS. For materials and methods used to recondition defective concrete floors in warehouses, shops, and similar buildings, see TM 5-615.

2.18. Dustproofing Concrete Floors

If dusting of concrete floors is an immediate problem, see discussion of dustproofing materials and methods of application in TM 5-615.

2.19. Arms Racks

As a temporary expedient, post engineers may construct improvised small-arms security facilities by placing hinges, hasps, and a lock on the chest in which arms were shipped; making an A-frame out of 2 x 4's, with steel bars locking above and below the trigger guards; or building a wall frame with the same type locking bars as the A-frame. The work will be done only upon proper certification that prefabricated arms racks had been requisitioned from the Ordnance Department depot but were not available, that all other means of protecting small arms have been exhausted, and that

the improvised facilities are needed. Repairs and utilities funds will be used.

2.20. Insect Screens

Window and door screening will be provided in the following buildings in all temperature zones: barracks, officers' quarters, administrative buildings, recreation buildings, mess halls, and latrines. Unless more economical and practical methods of screening are devised locally, TM 5-616 should be followed. Because of material limitations, the quality of galvanized screen cloth used in wartime Army installations is generally lower than that obtaining under prewar standards; therefore, proper maintenance of screens is extremely important. Screens must not be left in place until replacement of the cloth is required; they will be taken down and repaired whenever necessary.

a. INSTALLATION, MAINTENANCE, AND WINTER STORAGE. Materials and methods for installation, maintenance, repair, and storage of screens are set forth in TM 5-616. Recommendations on storage and painting also apply to galvanized screens on prewar buildings; however, in those cases painting probably will be required less frequently. Where insects are no problem in the winter, removable screens should be taken down and stored during the winter months if they can be stored in the building from which removed. When taken down, screens and the window frames from which they are taken should be numbered identically.

b. STAND-BY STORAGE. When a post is placed in excess, surplus, or stand-by status, screens will be removed immediately from all windows and placed inside the building, against the wall, and under the windows from which they were taken. When the building is reoccupied, troops moving in will replace the screens.

c. FIRE PREVENTION. To comply with fire-prevention requirements, all screen doors on openings through which out-going traffic must pass will be hung to swing in the direction of exit travel. *All reference to in-swinging screen doors on drawings and in specifications should be disregarded.* Drawing No. 700-3145 has been issued to show details of several types of combination screen and solid-panel doors for use in new construction and repair work. They are designed to meet both sanitary and safety requirements by

the use of a single door opening out. When either screen or solid door of a screened door opening has become so worn or damaged that replacement or major repair is necessary, a combination door should be installed to swing out. Solid-panel doors may be remodeled in accordance with details shown on the above-mentioned drawing. This policy does not constitute authority for replacement of doors in good condition.

2.21. Window Shades

a. **HOSPITAL BUILDINGS.** If the commanding officer feels shades are necessary, they may be provided in the following hospital buildings:

- (1) Administration buildings.
- (2) Offices in all buildings.
- (3) Nurses' quarters.
- (4) Officers' quarters.
- (5) Guest houses.
- (6) All bed wards, including single-bed wards (except detention or neuropsychiatric wards).
- (7) Examination, treatment, and nurses' rooms in ward and clinic buildings (except windows with lightproof shades).

b. **WAC BUILDINGS.** If the commanding officer feels shades are needed, they may be provided in the following WAC buildings:

- (1) Sleeping rooms in barracks.
- (2) Toilets or bathrooms without obscure glass windows.
- (3) Officers' quarters.
- (4) Infirmarys.
- (5) Recreation rooms.
- (6) Hairdressing shops.

c. **OBSCURE GLASS WINDOWS.** No shades will be provided on any windows which have obscure glass.

d. **MATERIALS AND INSTALLATION.** Materials and installation will conform to requirements of OCE Guide Specification No. 76, Shades, Window, Blackout and Lightproof (available through CE channels). Shades may be provided in other locations on submission of sufficient justification.

2.22. Venetian Blinds

Generally, venetian blinds will not be furnished. In special circumstances, some type of opaque roller shade may be installed for protection from the sun.

2.23. Shower Curtains

The Corps of Engineers is responsible for procuring shower curtains, including specification, determination of requirements, provision of funds, purchase, and inspection. Shower curtains will be installed in WAC barracks and nurses' quarters and, when considered necessary, in buildings such as female dormitories or family type public quarters. Installation in buildings designed for male occupancy will be approved only when special justification exists.

Note. Shower curtains will not be procured centrally.

2.24. Signs

The post engineer is responsible for preparation, erection, and maintenance of identification and directional signs for building exteriors and interiors. These signs will conform to provisions in TM 5-618 (when published).

2.25. Washing Walls

Washing walls preliminary to painting is considered to be a repairs and utilities responsibility and will always be accomplished by the post engineer. Washing walls for other purposes is considered to be a custodial service and will be accomplished in accordance with responsibilities for custodial services. (See par. 4.22.)

2.26. Shower Room Floors

To meet the sanitation standards established by The Surgeon General, all floors where men stand or walk with bare feet, such as shower rooms and aprons of swimming pools, will be scrubbed and washed daily. The use of duckboards in shower rooms is optional as their only value is in the prevention of accidents. When duckboards are used therein they should be removed and dried daily by exposure to sunlight and air. If showers are in such constant use as to prevent complete drying of duckboards daily, two sets should be provided. See paragraph 4.22 for responsibility for furnishing civilian personnel for performance of scrubbing and washing. Duckboards, when required for prevention of accidents, will be furnished by the post engineer.

Section III. HOUSING AND QUARTERS

2.27. Family Type Noncommissioned Officers' and Officers' Quarters

a. CONSTRUCTION OR CONVERSION. The construction in continental United States from War Department funds of new quarters for married officers and married noncommissioned officers entitled to quarters has been suspended. This prohibits using War Department funds to provide new family type officers' quarters for military personnel by converting or rehabilitating existing temporary or permanent buildings.

b. REHABILITATION. Not more than \$500 per set of quarters will be spent to rehabilitate or remodel existing permanent noncommissioned officers' quarters; for bachelor officers' quarters the maximum will be \$750 per officer capacity; and for family type officers' quarters, \$1,000.

c. MAINTENANCE AND REPAIR. Locally available recurrent maintenance funds may be used for normal maintenance and repair of existing family type quarters.

2.28. Bachelor Officers' Quarters

Housing for bachelor officers may be provided in accordance with the basic housing schedule, subject to limitations in War Department Construction Policy, Zone of the Interior. When reduced space allowances require temporary use of enlisted barracks to house bachelor officers, they will not be partitioned into separate officer rooms. Additional lavatory and latrine facilities will be provided if they are not an integral part of enlisted housing used as officer quarters.

2.29. WAC Housing

a. GENERAL. New construction for WAC housing will be permitted only when conversion of existing facilities is impractical. While WAC members are replacing enlisted men, the post commander will arrange to house both male and female personnel. Displaced male personnel may be housed by erecting tents or reducing space allowances. In providing WAC housing, the following will be considered:

(1) Location within reasonable walking distance of place of work.

(2) Location within area of complement or overhead installation to which WAC members are assigned. (This requirement does not apply to class III stations.)

(3) Distance from housing for male personnel: unless there is an intervening structure, minimum distance should be 150 feet.

(4) Possible future expansion.

b. QUARTERS. In converting quarters for WAC use, 60 square feet will be allowed per enlisted woman, and 120 square feet per officer; officers will not be housed with enlisted women. Toilet facilities, either in barracks or in separate lavatories, will be on the basis of 1 toilet per 8 to 10 individuals. Inclosed walkways will be required between separate lavatories and barracks. Water closets will be provided with partitions and doors, and showers with partitions and curtains. On buildings more than one story high, fire ladders will be replaced by stairways.

c. MESSING FACILITIES. Either unit or general messes will be provided. For reasons of economy, WAC messes should be combined whenever practicable; they may be consolidated with enlisted men's messes.

d. UNIT ADMINISTRATION AND SUPPLY. Administration space will be provided for each unit as required. Supply space will be approximately 2 square feet per enlisted woman.

e. RECREATION. Recreational facilities will be provided in accordance with paragraph 2.43.

f. HAIRDRESSING. Sufficient space, equipped with necessary utilities, such as water, sewer, and electricity, will be provided for a hairdressing shop.

g. LAUNDRY. Approximately one laundry tub with hot and cold water, one ironing board, and adequate drying racks will be provided for each 20 WAC members. Duckboards will be provided under ironing boards to protect against electric shock. (See TM 5-616.)

h. HOSPITAL. No separate hospital facilities will be furnished. A separate infirmary will be provided when WAC strength exceeds 600.

2.30. Civilian Housing

a. TRANSFERRED TO WAR DEPARTMENT JURIS-

DICTION. Lanham Act civilian war-housing projects which have been transferred to the jurisdiction of the War Department are to be administered as public quarters in accordance with AR 210-10. In assigning quarters, the purpose for which the housing was provided will be considered; so far as practicable, preference will be given to essential civilian war workers whose continued employment would be endangered by lack of adequate housing. War Department repairs and utilities funds may be used for repairs and utilities expenditures on civilian war-housing projects transferred to the jurisdiction of the War Department.

b. CONVERSION OF CIVILIAN HOUSING. When continued employment of key civilian employees would be endangered by lack of adequate housing, dormitory type civilian housing may be converted to family quarters. The cost of such rehabilitation or conversion will not exceed \$750 per family unit; it will include:

(1) Repairs and alterations to buildings, not to exceed mobilization type standards.

(2) Extending and providing utilities.

(3) Repairs and installation of heating equipment. Value of requisitionable heating and refrigerating equipment and cooking ranges will not be included in total cost allowance.

(4) Total anticipated cost, other than normal repairs, for the forthcoming 5 years.

2.31. Conversion to Civilian Housing

a. RESPONSIBILITY. Many Army camps now have vacant military barracks which could readily be converted to dormitories for civilian employees. War Department construction policy prohibits use of War Department funds to convert troop housing for civilian use. However, the National Housing Agency will be responsible for planning and financing conversion of military barracks to dormitories for civilian employees; but the War Department will be responsible for the work and will retain jurisdiction over the housing facilities, including management, maintenance, and repair.

b. PLANNING. To prepare conversion programs, National Housing Agency regional representatives will consult commanding generals of service commands to determine the needs which can be met through conversion of vacant military barracks.

c. STANDARDS. Normally, military barracks will be converted only to dormitories for single men

or women; except under special circumstances, conversion to family quarters is not considered practicable. Standards for conversion will be approximately as follows:

(1) For male occupancy, standards will not exceed those for bachelor officer quarters.

(2) For female occupancy, standards will be approximately the same as for male occupancy. Additional laundry and toilet facilities and showers will be provided in accordance with standards shown on OCE drawings 900-1535 and 900-1540. Bathtubs will not be installed. Exterior fire-escape stairs will be constructed in lieu of ladders at the end of the building opposite the existing interior stairway.

d. PROCEDURES. To keep procedures uniform projects for conversion of military barracks will be processed in the same manner as any other civilian war-housing project. However, they will be accomplished by the Chief of Engineers.

e. OPERATION AND MAINTENANCE. Civilian war-housing projects consisting of converted military barracks will remain under the jurisdiction of the War Department and will be operated and maintained as public quarters in accordance with AR 210-10.

2.32. Housing Capacities and Space Allowances

a. DESIGNED CAPACITIES. (1) In drafting reports on housing and use of existing facilities, housing capacity for buildings not listed in the instructions for making the report will be based on the following allowances:

(a) Sixty square feet per enlisted man or woman or enlisted prisoner of war.

(b) Eighty square feet per cadet, flying student, or officer candidate.

(c) One hundred twenty square feet per male or female commissioned officer, flight officer, warrant officer, or commissioned prisoner of war.

(d) Ninety-five square feet per civilian.

Note. Family type quarters will be reported as capable of housing one officer or enlisted man.

(2) The following buildings will be properly utilized but will not be shown in housing reports:

(a) Guard houses or other buildings within the stockade area for housing military prisoners other than prisoners of war.

(b) Guest houses.

(c) Fire stations quartering personnel during duty periods only.

(d) Heater rooms, hall stairs, and other space not included as housing space.

b. SPACE ALLOWANCES. Current minimum net space allowances are as follows:

(1) *Barracks*. Forty square feet per man. At reception centers, minimum is 50 square feet per man; this allowance can be reduced only in emergencies. At replacement training centers and schools, reduction should be made only after careful consideration because of the peculiar training problems involved. Reductions will be made to reduce or eliminate need for additional construction or conversion.

(2) *Tents*. Six men per pyramidal tent; 8 in emergency.

(3) *Hutments*. Eighteen men; 22 in emergency.

(4) *Hospitals*. One thousand cubic feet per patient; 100 square feet of floor space, which may be reduced temporarily to 72 square feet in emergency.

(5) *Military Offices*. General officers, 200 square feet; other officers, 100 square feet; sergeants, first three grades, 80 square feet; other enlisted personnel, 50 square feet.

(6) *Civilian Offices*. Key civilian personnel, 100 square feet; professional and administrative personnel (CAF-5 and above), 80 square feet; clerical and other civilian personnel, 50 square feet.

2.33. Prisoner of War Camps

a. TYPES OF CAMPS. Prisoner of war camps are class I installations. (See AR 170-10.) Base camps are established on a permanent basis for complete administration of prisoners of war. Branch camps are permanent or temporary camps set up to fill a definite work need and to administer prisoners of war under the supervision and with the assistance of the base camp.

b. CONSTRUCTION STANDARDS. Base and branch prisoner of war camps will conform to minimum required standards of housing and security. War Department funds will not be used to set up prisoner of war camps to provide prisoner of war labor for private contractors, unless estimated net income to the Government during the life of the contract or within a 6-month period will exceed

construction or conversion costs. Base camps will not be built by entirely new construction. Approval by the commanding general of the service command of a request for construction will certify compliance with these provisions. Prisoner of war camps will be located to insure maximum employment of prisoners of war and maximum utilization of existing available housing such as military installations, CCC and NYA camps, State and local fair grounds, etc.

c. CONVERSION OF EXISTING HOUSING. Prisoner of war camps established through conversion of existing housing will provide the following:

(1) Sufficiently heated and lighted buildings or tents.

(2) One hundred twenty square feet per man in officers' quarters.

(3) Forty square feet per man in enlisted men's quarters.

(4) Sanitary facilities conforming to AR 40-205.

(5) One laundry tub for every 25 men.

(6) Indoor recreation space, based on 2 square feet per man at year-round camps.

(7) Army exchange space, based on 2 square feet per man at year-round camps.

(8) Suitable infirmary facilities in each compound or available in the immediate vicinity.

(9) Space for religious services; if feasible, a separate building may be provided.

(10) Barbed- or hog-wire fence, single or double.

(11) Warehouse space either on or off the camp.

(12) Outdoor recreation area.

(13) Sentry boxes or guard towers.

(14) Adequate drainage.

(15) Adequate water supply, approved by appropriate authorities.

(16) Sufficient hot water.

(17) Hospital facilities in or near the camp.

(18) Guard house or detention facilities in or near the camp.

(19) Adequate lighting of fences and surrounding grounds.

Standards of water, light, and sanitary facilities in former CCC camps will be deemed adequate for guard personnel and prisoners of war if there is a minimum of 40 square feet per enlisted man or enlisted prisoner of war. More permanent

types of facilities, such as water-borne sewage and guard towers, will be installed in camps to be used on a year-round basis; temporary type facilities such as pit latrines and sentry boxes will be provided for other camps.

d. SECURITY MEASURES. Desirable security measures and specifications for prisoner of war camps are listed below. They should be considered in selecting sites and converting housing, but no camp will be rejected because one or more of the items is lacking.

(1) At least 500 feet between any boundary, public road, or railroad and all fence-inclosed areas.

(2) At least 75 feet between inner fence and buildings inside the stockade.

(3) At least 30 feet between buildings.

(4) A maximum of 1½ to 2 miles from camp to the nearest fire station.

(5) Auxiliary lighting system.

(6) Work shop based on 2 square feet per man.

e. TENT CAMPS. Tent camps established as prisoner of war camps will meet the minimum standards for United States troops in the field

under similar conditions and for an equal period of time. So far as practicable, the facilities listed in *c* above, will be provided.

f. HOUSING FOR GUARDS. Housing and other facilities for guard personnel will be equivalent to that provided other United States military personnel under similar conditions of duty on post or in the field. Except in unusual circumstances, housing and other facilities for guard personnel will be at least substantially equivalent to those provided for prisoners of war at that camp.

g. FENCING AND FLOODLIGHTING. Fencing and floodlighting are authorized around the perimeter of the camp. They will not be installed around individual post buildings in which prisoners of war are employed and where their principal employment is within the building. Such buildings include post laundries, bakeries, repair shops, and similar facilities.

h. PRISONER OF WAR LABOR. Maximum use will be made of prisoner of war labor in establishing, converting, maintaining, and dismantling security and housing facilities for prisoners of war and essential guard personnel.

Section IV. LEASED PREMISES

2.34. Acquisition of Real Estate

a. LIMITATIONS. The restrictions listed in paragraph 2.1*b* govern the acquisition of real estate by lease or purchase.

b. STANDARDS. Generally, buildings should not be leased if they require extensive alterations or additions. Alterations or additions which are required should be held to bare essentials and should be fully planned and estimated before the lease is executed. When buildings which are approximately equal in suitability are proposed for lease for military purposes, selection will be on the basis of total cost, including lease rental, repairs, alterations and improvements, cost of restoring premises at the end of the lease period, and cost of handling, protecting, and storing incidental property. Current War Department plans and specifications for temporary buildings will be used to determine standards for alterations of leased buildings. No attempt will be made to match alterations with existing construction which is a higher type or which costs more than War Department standards permit.

2.35. Issuing Certificates of Necessity

a. AUTHORITY OF DIVISION ENGINEERS. Division engineers can issue certificates of necessity required by Public Law 530, 77th Congress, when alterations, improvements, and repairs to be made by the Government to leased property exceed 25 percent of the annual rental within the scope of section 322, Economy Act, 30 June 1932. This authority is limited to alterations, improvements, and repairs costing no more than \$10,000.

b. REQUESTS TO CHIEF OF ENGINEERS. When the cost of any proposed project exceeds \$10,000, the division engineer will request the Chief of Engineers to issue the necessary certificate. The request will be accompanied by adequate proof of necessity, and by a statement of the total cost of all work to be done under the project, broken down as follows:

- (1) Cost of alterations, improvements, and repairs.
- (2) Cost of temporary installations.
- (3) Other work.

(4) Total cost of prior alterations, improvements, and repairs.

(5) Previous certificates issued.

c. INITIAL ALTERATIONS AND REPAIRS. In all cases requiring issuance of a certificate, the amount specified in the certificate or the amount requested should be enough to provide all facilities likely to be needed by the using service during the term of the lease. Once leased premises are placed in condition for use, there should be no need for additional certificates in small amounts for individual nonrecurrent projects; only normal upkeep (recurrent work), for which a certificate is not required, should be necessary. However, should unforeseen essential requirements arise at a later date, another certificate will be necessary to cover them. Further certificates of necessity should be held to a minimum; they should be issued only if the using force or service certifies compliance with requirements of paragraph 2.1*b*.

d. WORK OUTSIDE SCOPE OF SECTION 322, ECONOMY ACT. The following do not come within the scope of section 322 of the Economy Act:

(1) *Removable equipment.* The cost of installing the following should not be included in the amount covered by the certificate of necessity required by Public Law 530, 77th Congress: equipment, apparatus, appliances, machinery, fixtures, movable partitions, etc., which are unattached, movable, or detachable articles temporarily held in place by light braces, bolts, or screws which may be removed without injuring or defacing the item or the building, and which are not intended to become an integral part of the building. (See 20 Comp. Gen. 105.)

(2) *Restoration.* Restoration of leased premises to their original condition on termination of the lease is not considered an alteration, improvement, or repair of leased premises within the scope of section 322 of the Economy Act; no Certificate of Necessity is required even though the amount exceeds 25 percent of the annual rental. (See 20 Comp. Gen. 105.)

(3) *Damage resulting from use and occupancy of leased premises.* No Certificate of Necessity is required under Public Law 530, 77th Congress, when repairs are necessary due to negligence of

Government employees, or when damage, caused through use not ordinarily contemplated in the lease, must be repaired so the Government can continue to use the premises. Such items of repair should be considered as restoration, since they would normally be necessary when the use of premises is discontinued and they are restored under terms of the lease.

(4) *Maintenance of premises.* Leases ordinarily will provide that the lessor maintain the premises. However, when terms of the lease require maintenance by the Government, such maintenance may be performed without issuance of a Certificate of Necessity under Public Law 530. As used here, maintenance is the *recurrent* upkeep and preservation of the existing condition of the property and utilities services which is necessary in normal use of the leased premises; it should be distinguished from alterations, improvements, repairs, additions, remodeling, or other changes of a *nonrecurrent* nature.

(5) *Alteration, improvement, and repair.* Work is not considered alteration, improvement, or repair within the scope of section 322 of the Economy Act if it can be readily removed without injury to the leased premises or the article itself. In that case, it need not be considered in the issuance of a Certificate of Necessity, because under the provisions of the standard form of Government lease it is still considered the property of the lessee, the Government, and has never lost its identity as such. By the interpretation of the Comptroller General, an article becomes part of the leased premises if it is so attached or annexed that its removal damages the premises or the article itself; because that increases the value of the premises for the lessor, such articles should be covered by issuance of a Certificate of Necessity.

e. WORK PRIOR TO ISSUANCE OF CERTIFICATE OF NECESSITY. When alterations or repairs to leased real estate require issuance of a Certificate of Necessity under Public Law 530, post engineers will not begin such work until the certificate has been issued. When the limit established by any certificate is reached, no further work will be done until a further certificate is issued.

f. RENT-FREE AND NOMINAL-SUM LEASES. When premises are occupied rent free or at a nominal rental such as \$1.00 per annum, all amounts spent for alterations, improvements, and

repairs will be regarded as rent. The following guides will apply:

(1) When rental plus amounts to be spent by the Government for alterations, improvements, and repairs total \$2,000 or less, limitations of section 322 of the Economy Act, as amended (47 Stat. 412, 1517) do not apply. Therefore, a certificate under Public Law 530 is not required.

(2) When rental plus amounts to be spent by the Government for alterations, improvements, and repairs total more than \$2,000 but not more than 15 percent of the fair market value of the premises at the date of the lease, a certificate under Public Law 530 is not required.

(3) When rental plus amounts to be spent by the Government for alterations, improvements, and repairs total more than \$2,000 and more than 15 percent of the fair market value of the premises at the date of the lease, a certificate under Public Law 530 is required.

2.36. Procedure for Issuing Certificates of Necessity

a. SUBMITTING REQUESTS FOR CERTIFICATES. Requests for Certificates of Necessity for additions, alterations, remodeling, improvements, initial repairs, repairs involving improvements, or other nonrecurrent changes will be supported by WD AGO Form 5-25 properly approved in accordance with AR 100-80 and with a statement that the work meets the requirements of paragraph 2.1*b*. They will be submitted—

(1) To the division engineer if total expenditures on the leased premises, including the proposed project, exceed 25 percent of the annual rental, and the cost of the proposed project is not more than \$10,000.

(2) To the Chief of Engineers, with review and comments by the division engineer from a real estate standpoint, when total expenditures including the proposed project exceed 25 percent of the annual rental, and the cost of the proposed project is more than \$10,000.

b. LIMITATION ON POST COMMANDER'S AUTHORITY. The \$1,000 approval authority of the post commander (AR 100-80) is limited by certificate rules. A certificate is necessary when the total cost of all alterations, improvements, or repair is more than 25 percent of annual rental regardless of the cost of the individual project.

2.37. Converting Leased Premises to Hospitals

In converting buildings to hospital use, structural changes must be held to a minimum. Convenient but unnecessary refinements often found in civilian buildings designed for hospital purposes will not be incorporated. When hotels or other buildings are acquired for the Medical Department's use and the essential alterations have been approved by the Chief of Engineers and The Surgeon General, no material deviation will be made without prior written approval of the Chief of Engineers and The Surgeon General.

2.38. Restoring Leased Premises

a. RESPONSIBILITY OF GOVERNMENT. Under the standard-form lease and in the absence of terms to the contrary, the Government may be responsible for restoration in the following cases:

(1) When damage is due to Government's negligence.

(2) When necessitated by alterations and removals made by the Government.

b. LIMITATIONS ON GOVERNMENT RESPONSIBILITY. Under the standard-form lease, the Government is not responsible for repairs made necessary by reasonable wear and tear, by the elements, or by circumstances beyond the Government's control. Work in this category includes:

(1) Foundation work.

(2) Waterproofing.

(3) Exterior tuck pointing.

(4) Repairing catch basins, cesspools, and manholes.

(5) Repair of—

(*a*) Interior unfinished walls.

(*b*) Unfinished hollow-tile, concrete-block, or gypsum-block walls.

(*c*) Floor joists, roof trusses (including roof boards and roofing), and framing timbers (including studs, sheathing, and exterior surfaces).

(*d*) Insulating materials in walls damaged by leakage in walls or roof.

(*e*) Plaster damaged by leakage in walls or roof.

(*f*) Windows and doors damaged by elements or by inadequate hinging, counterweighting, calking, or sealing.

(*g*) Sheet metal such as eaves, gutters, downspouts, flashings and counterflashings, hips, valleys, skylights, ventilators, and metal ceilings.

(*h*) Structural steel or iron.

(*i*) Fire escapes.

(*j*) Heating systems.

(*k*) Plumbing systems.

(*l*) Ventilating and air conditioning systems.

(*m*) Power plants.

(*n*) Electric wiring.

(*o*) Lighting fixtures (including replacement).

(*p*) Sprinkler systems.

(*q*) Settling or subsidence.

(6) Other structural repairs to buildings or equipment.

c. PERFORMANCE OF RESTORATION. Restoration may be performed directly or by contract within the estimated cost approved by the division engineer. When the lessor will accept a sum less than the cost of restoration, a settlement may be negotiated in lieu of restoration. The division engineer will take action sufficiently in advance of termination of leases to insure the removal, sale, or salvage of alterations and improvements made by or at the expense of the Government. Alterations and improvements may be sold at their fair market value to the lessor in lieu of restoration or in part settlement of such allowance; to the contractor who performs the restoration work; or to others.

d. AUTHORITY OF DIVISION ENGINEER. The division engineer can restore leased premises or execute supplemental agreements in settlement of restoration where the amount involved does not exceed \$10,000. Cases involving more than \$10,000 will be submitted to OCE for approval. Certificate under Public Law 530 will not be required for restoration work, regardless of its cost. The cost of restoration work performed directly by the Government or by contract, or compensation in any settlement agreement in lieu of restoration, will be met from funds available to the division engineers for payment of rental.

2.39. Training-unit Schools and Colleges

a. ALTERATIONS, IMPROVEMENTS, AND REPAIRS. The division engineer will determine the improvements, alterations, and repairs necessary for the functioning of school and college training units and the estimated cost of the work; he will give the contracting officer his written approval for inclusion in the training-unit contract. The institution will not be advised of final approval until

issuance of the Certificate of Necessity, if one is required. In determining and approving the improvements, alterations, and repairs necessary for the functioning of any training unit, the division engineer will be guided by the policy covering construction and maintenance standards.

b. INSPECTIONS. Standards of fire protection, safety, sanitation, structural strength of buildings, water supply and purification, proper operation and maintenance of Government-owned engineer equipment, and similar functions will meet Army standards set for posts, camps, and stations for which service command engineers are ordinarily responsible. To insure this, the service command engineer will periodically inspect the real-property facilities provided for training units of the AAF

and ASF. A report of the inspection will be referred for appropriate action to the commanding officer of the installation inspected. If the institution does not take the corrective action recommended by the service command engineer, an information copy of the report will be sent to Repairs and Utilities Division, OCE.

c. SUPPLY. Approved standard items of issue will be furnished upon request and without reimbursement to such schools and colleges.

d. TERMINATION. For procedures for terminating War Department training-unit contracts and for disposing of excess and unserviceable property under War Department training contracts, see M 102.

Section V. SPECIAL-PURPOSE BUILDINGS AND STRUCTURES

2.40. Banking Facilities

All maintenance, repair, rehabilitation, alteration, or construction of authorized banking facilities will be in accordance with War Department construction policy and schedules of housing requirements. New construction will be recommended only after the post commander has made sure that no existing building is adequate, available, or adaptable for use of the proposed banking facility. Banking facilities will be furnished adequate light, water, power, heat, and sewerage at the expense of the Government. Janitor services will be furnished at the expense of the Government in accordance with paragraph 4.22. If a vault is built, every effort will be made to secure a second-hand vault door.

2.41. Manufacturing Plants

Maintenance responsibilities for buildings and structures at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds are outlined below. OS denotes operating service; RU, repairs and utilities.

<i>Function</i>	<i>Responsibility</i>
Maintenance and repair	RU
Rehabilitation:	
For normal use	RU
For special industrial use	OS
Alteration:	
For general use	RU
For special industrial use	OS
Addition:	
For permanent and/or general use....	RU
For special temporary industrial use..	OS
Cleaning and janitor service:	
General:	
Industrial	OS
Nonindustrial buildings and grounds	OS
Window cleaning	OS

Note. While certain of the above items are assigned to the operating service, repairs and utilities offices should provide service for field agencies where maintenance, repair, alterations, or additions are being made to what is commonly known as industrial facilities. For a list of facilities to which this policy applies, see paragraph 1.9.

2.42. Post Exchanges

Because of the constant reduction in troop strength in the continental United States, construction, maintenance, and purchase of equipment for post exchanges financed through nonappropriated funds (AR 210-50) must be limited to projects absolutely essential to providing welfare services and facilities for military personnel. For administrative procedures concerning projects involving use of nonappropriated funds, see paragraph 1.20. War Department funds can be used to build additions, extensions, and alterations to Government-owned exchange buildings (AR 100-80) within the limitations of the basic housing schedules. See par. 2.1b.

a. **BUILDINGS.** At posts, camps, stations, or installations where exchange buildings have not been provided from funds made available by the War Department, the commanding officer will set apart for use of the exchange any available suitable public building or rooms. The post engineer will use funds for maintenance and operation of buildings, structures, and utilities on the post, camp, station, or installation to maintain public or temporary buildings occupied by exchanges.

b. **NEW CONSTRUCTION.** New construction may be undertaken only in accordance with limitations prescribed by AR 210-65. If no existing buildings are available, a temporary building of a type, plan, and construction approved by the Chief of Engineers may be erected. Available troops and Government materials, tools, and facilities may be used for all or part of the work. If appropriated funds are not available and, if the commanding general of the service command approves, the commanding officer may use exchange funds to erect a temporary exchange building. The commanding general of the service command will approve the choice of building site. At class III installations, he will also obtain the concurrence of the air force command concerned. Buildings erected by exchanges on military reservations with proper authority and solely at their expense remain their property; on written authorization of the commanding officer, such buildings may be sold by the exchange when no longer needed. Private individuals or commer-

cial concerns can erect temporary buildings on military reservations only by permission of the Secretary of War. This authority is not required for construction by exchanges or for construction contracts between exchanges and private individuals or commercial concerns which specify that title passes to the exchange immediately upon completion of the buildings. Exchange funds may be used for alterations or additions to buildings made in accordance with AR 210-65.

c. MATERIALS, SUPPLIES, AND EQUIPMENT. With the post commander's approval, an Army exchange, as a War Department instrumentality, can request the post engineer, as a War Department agency, to furnish available services, materials, supplies, equipment, or work. The post exchange will pay the post engineer promptly for the actual cost of materials, supplies, or equipment furnished, and of incidental services performed; the post engineer will determine the cost of such service. Payment will be by check drawn on exchange or other available unappropriated funds, and will be turned over to the local finance officer for credit to the repairs and utilities appropriation.

d. ALTERATIONS, EXTENSIONS, AND ADAPTATIONS. Exchange or other nonappropriated funds can be used for alterations, extensions, and adaptations to Government-owned exchange buildings, *if applicable construction and repairs and utilities policies of the War Department and Chief of Engineers are followed.*

2.43. Recreational Buildings

a. EXISTING FACILITIES. Existing recreational facilities will be used to the fullest extent and will be increased only if they are seriously inadequate or if unusual circumstances exist. Requests for such increases must be thoroughly reviewed by the commanding general of the service command or appropriate air force or AAF command before being submitted to the Chief of Engineers. This review will include consideration of facilities in civilian communities which supplement Army recreational programs. All new construction will be theater of operations type unless specifically justified otherwise.

b. AUDITORIUM EXITS. In hospital recreation buildings used by patients, auditorium exits will

have ramps leading from auditorium floor to grade level.

c. BOWLING ALLEYS. Current War Department construction policy does not authorize construction of buildings or extension of existing buildings to house bowling alleys. However, as an exception to this policy, bowling alleys may be provided at convalescent (but not general) hospitals in connection with the reconditioning program. They may be provided by conversion of existing buildings as far as practicable. Requirements for class A convalescent beds planned for long-term use are as follows:

(1) Sixteen bowling alleys for the first 2,000 convalescent beds.

(2) Four additional alleys for each additional 1,000 beds.

2.44. Outdoor Athletic Facilities

Outdoor recreational facilities constructed from appropriated funds and which consist of real property, such as improved grounds and/or fixed structures which are transferred to the accountability of the post engineer, will be maintained and repaired by the post engineer using repairs and utilities funds available locally. Portable outdoor recreational equipment, such as movable baseball back-stops, bases, nets, markers, and playing equipment will not be the responsibility of the post engineer for maintenance and repair. The responsibility of the post engineer as outlined above does not include the pregame grooming of the facility, such as painting foul lines, court lines, and field markers; installing bases and nets; and erecting or dismantling portable bleachers.

2.45. Messing Facilities for Civilian Employees

a. AUTHORITY. The War Department will follow AR 210-100 in acting on requests to replace or supplement exchange-operated post restaurants with post restaurants not under exchange jurisdiction for use of civilian employees at Army exchanges. War Department appropriated funds cannot be used to buy operating accessories not attached to the structure, such as china, silverware, tables, chairs, and cooking utensils. The Chief of Engineers can build civilian-employee messing facilities in accordance with War Department construction policy if it is clearly shown

that new construction is the only way to meet the need. Specific authority must be secured in each case. The post engineer's maintenance and repair responsibility for post restaurants is similar to that for post exchanges.

b. **REQUESTS.** The following data will be submitted with requests for authority to establish a post restaurant:

- (1) Availability of shelter and equipment.
- (2) Whether or not a concessionaire will conduct operations.
- (3) Copy of proposed contract with concessionaire.
- (4) Number of civilian personnel to be served.
- (5) Number of enlisted men to be served.
- (6) Availability of other similar facilities.
- (7) Method of financing. (See AR 210-100.)
- (8) Use to be made of profits or concession fees.

2.46. Chapels for Prisoners of War

A separate building for use as a chapel will be provided at all permanent prisoner of war camps. Wherever possible, this facility should be provided by converting an existing barracks building, the interior furnishings being constructed by the prisoners. The Provost Marshal General is to be informed of all such buildings converted. Chapels should be located inside the stockade, near the gate to the recreational area, with proper clearance from the double fence. Necessary materials for conversion may be obtained using repairs and utilities funds. In exceptional instances where construction of an additional building is required, building a type RB-A-T recreation building with prisoner labor should be considered.

2.47. Welfare Agency Facilities

Welfare agencies should meet the cost of non-recurrent maintenance projects for their facilities. Normal repairs and maintenance, including requirements of light, heat, power, etc., will be provided by post engineers without reimbursement. However, where such privileges are abused, reimbursement should be requested.

2.48. Public Telephone Facilities

Under existing construction policy, War Department funds cannot be used to erect buildings or

rooms for use by private enterprise on military reservations without a permit as required by established real estate procedures. When there is a definite need for additional public telephone service, the post commander may initiate negotiations with the local telephone company to provide adequate housing for booths, switchboards, or other necessary facilities by conversion, new construction, or otherwise. The telephone company will meet the cost of the work. (See AR 100-62.) Should the telephone company agree to provide the necessary temporary housing, the negotiations and accomplishment of the permit will follow established real estate procedures. The permit may provide that the Government will not receive monetary compensation for use of the land occupied. At general, convalescent, and regional hospitals, and station hospitals of 1,500-bed capacity or larger, existing available space may be used to provide a public telephone room. ESA funds are applicable only to the extent of altering and preparing the space for adequate use. Construction standards are to be in accordance with existing War Department policies of construction and maintenance.

2.49. Fencing

War Department policy limits fencing at all Army installations to the absolute minimum. Fencing as required may be used for neuropsychiatric inclosures. Chain link fencing and woven wire fencing weighing not over 2 pounds per linear foot and not over 0.33 pounds per square foot is applicable to inclosure of prison stockades, sea-coast fortifications in populous areas, neuropsychiatric wards at station and general hospitals, standard internment camps, radio transmitter stations, primary substations, transformer stations, airport gasoline-storage facilities, toxic gas yards, and minimum perimeters around individual structures designated as bombsight-storage buildings, armament fire-control supply and repair buildings, and armament instrument inspection and adjustment buildings. All other uses of woven-wire and chain-link fencing are prohibited unless specifically approved by OCE before construction begins. Since only an extremely limited amount of chain-link fencing is now being manufactured, it should be reserved for the most critical areas. Plain- or barbed-wire fencing will be used for other pur-

poses when required for military construction. Perimeter fencing will be approved only where required by exceptional circumstances.

2.50. Vacant Buildings on Marginal Lands

The care of vacant buildings located on marginal lands and not required for military purposes is a command responsibility even though they are not directly used by local commanders in the accomplishment of their missions and every effort should be made to prevent lack of maintenance. The best long-range interest of the Government will be served by providing reasonable maintenance and protection of all structures (dwellings, farms, utilities, etc.) which have been acquired in fee by the Government. The eventual sale of these marginal lands will be vitally affected by the condition of the farm buildings and dwellings located thereon. In those cases where the land and buildings are leased to individuals for agricultural purposes, action will be taken through the appropriate division engineer to require the lessees to maintain the structures according to the terms of the lease.

2.51. Training Aids

The repairs and utilities mission includes the maintenance and repair of all training aids which are post, camp, or station property provided that the maintenance and repair requested or indicated

are not those which would normally be performed in the field by the using force or agency.

a. DEFINITION. The term training aids as used herein includes training facilities such as target ranges; bayonet courses; obstacle courses; shooting galleries and ranges for small-arms target practice; target frame shelters for markers; observation towers; drill fields; stabilized earth and paved surfaces; permanently installed fences, anchor posts, platforms, and markers; and appurtenances commonly fabricated at the site, such as racks, benches, portable equipment, sighting bars, aiming devices, blackboards, platforms, mock-ups, etc.

b. SUPPLY OF UTILITIES SERVICES. The post engineer will supply water from any point on an established distribution system (including the supply of water for swimming pools and mock-ups used for training purposes), electricity, and similar utilities services.

c. SUPPLY AND FABRICATION. Training aids and spare parts therefor will normally be supplied by the agency vested with responsibility therefor by War Department Procurement Regulations or other War Department directives. However, they may also be fabricated without reimbursement by the post engineer under the provisions of paragraph 4.5.

d. TARGETS. Targets are not included in the above definition of training aids. The post engineer has no responsibility for their supply or maintenance.

Section VI. FORTIFICATIONS

2.52. Responsibility

a. **HARBOR DEFENSE.** Harbor defense commanders will coordinate maintenance and repair of fortifications and accessory structures within their areas to insure that military requirements of the command are satisfied at all times, so far as funds will permit. They will make certain that funds allotted for maintenance and repair are expended for the purposes and within the limitations set by the Chief of Engineers. The Chief of Engineers will function as the staff agency of the Commanding General, ASF, for work on fortification maintenance, repair, and alteration. The service command engineer, under jurisdiction of the commanding general of the service command, is responsible for maintenance, repair, and alterations of fortifications and accessories within the geographic limits of the service command. (See AR 100-20.) The post engineer in charge of fortification maintenance and repair (AR 100-80) will be responsible to the harbor defense commander for general execution of the work, and to the service command engineer for its technical sufficiency and for technical procedures used. No change will be made in the character, number, or location of major elements prescribed in a basic project without prior approval of the Chief of Staff. (See AR 100-20.)

b. **HISTORICAL FORTIFICATIONS.** The Chief of Engineers is responsible for preservation and repair of fortifications of historical interest.

c. **RADAR INSTALLATIONS.** Radar facilities will be maintained and repaired in accordance with instructions issued by the Chief of Engineers.

d. **CONSTRUCTION IN OR NEAR FORTIFICATIONS.** Unless otherwise prescribed, no nonfortification building or permanent work of earth, masonry, or timber will be erected in or near any fortification reservation without approval of the commanding generals of the defense command and the service command.

2.53. Maintenance Standards

Post engineers will apply the construction standards of paragraph 2.1, and will practice maximum economy in fortification maintenance.

2.54. Estimates

The post commander will prepare an estimate of funds needed to maintain and repair fortifications and accessory structures at each harbor defense command. The estimate will cover total funds needed for the succeeding fiscal year or years, as prescribed by the Chief of Engineers, for recurrent and nonrecurrent items of maintenance and repair and for fuel and operating supplies for searchlights, power plants, and engineer railway rolling stock at fortifications.

2.55. Request for Funds

The post commander will prepare quarterly requests for funds to maintain and repair fortifications and accessory structures during the succeeding quarterly period. The request will be presented to the harbor defense commander for approval, forwarded through the commanding generals of the defense command and the service command for review, and then forwarded to the Chief of Engineers in compliance with existing regulations. The post commander can prepare special requests for funds for individual nonrecurrent maintenance and repair projects and for supplementary recurrent needs which could not have been anticipated and which cannot wait until the next quarterly estimate. (See AR 100-20.)

2.56. Distribution of Funds

Funds for maintenance and repair work on fortifications and accessory structures will be made available to the post commander through the commanding general of the service command.

2.57. Expenditures

No more than \$10,000 will be spent at any one time or place on maintenance and repair of a fortification, accessory structure, or permanently installed property attached thereto, without prior approval of the Chief of Engineers. Commanding generals of service commands may authorize expenditures up to \$10,000 for fortification maintenance and repair, using available funds. Harbor defense commanders can approve expenditures up

to \$1,000 for fortification maintenance and repair, using funds locally available. Funds allotted for repair and maintenance of fortifications will not be used for new construction without prior approval of the Chief of Engineers. *Emergency* maintenance and repair fortifications may be authorized by the harbor defense commander without approval of higher authority. (See AR 100-20.)

2.58. Transferring Completed Structures

When the engineer work is completed on a fortification, part of a fortification, or accessory structure built by the Corps of Engineers, the district engineer in charge, when authorized by the Chief of Engineers, will notify the defense commander that he is prepared to transfer the structure to the using service. The defense commander or his designated representative will then inspect the work thoroughly and accept it if it is satisfactory, giving the district engineer a written statement to that effect. At the time of transfer, the district engineer will forward to the commanding general of the service command and the post engineer—

- a. Copy of letter of acceptance.
- b. Accomplished copy of the fortification's maintenance data sheet.
- c. Copy of report of completed works.
- d. Copy of transfer drawings.

2.59. Equipment

a. **GENERAL.** After new or modified fortifications have been transferred to the defense commander, he will coordinate all maintenance and all ordinary repairs of electrical equipment to meet the military requirements of the command at all times, so far as funds will permit. Before working parties are sent into a harbor defense installation to make repairs, the post engineer or other person in charge will notify the harbor defense commander of the work to be done, so a suitable time can be chosen for the work. Maintenance, repairs, and material alterations in lighting or power systems will be made by the service charged with their installation. (See AR 100-20.)

b. **COAST ARTILLERY.** Coast artillery troops will perform *routine* maintenance of submarine mines, *underwater* submarine-mine cables, and fire-control systems under supervision of the harbor defense commanders.

c. **CORPS OF ENGINEERS.** The Corps of Engineers will maintain power-generating units and related equipment which it furnishes, in accordance with AR 100-20 and instructions by higher authority. It will furnish fuel and operating supplies for power plants and engineer railway rolling stock.

d. **ORDNANCE DEPARTMENT.** The Ordnance Department is responsible for maintenance of—

(1) Power-generating units and related equipment which it furnishes. (See AR 100-20.)

(2) Submarine-mine casemate and mine-control equipment, including land cables used solely for electrical control of submarine mines (except routine maintenance performed by Coast Artillery; see *b* above).

(3) Motors, cables, *control devices*, and terminal boxes for gun and mortar carriages.

(4) Magneto firing and synchronous-data transmission systems which it furnishes.

e. **SIGNAL CORPS.** The Signal Corps is responsible for nonroutine maintenance of *radar* and communications elements of fixed fire-control systems.

2.60. Electrical Plants and Systems

a. **MAPS.** The post engineer will keep accurate drawings showing the location for each fort in the harbor defense of manholes, conduits, and all underground and aerial electrical conductors installed or maintained by the Corps of Engineers. Any additions or alterations made in these electrical systems will be reported to the post engineer for notation on the record drawings. When necessary, the post engineer will issue new prints showing these changes.

b. **FIXED CARRIAGES.** The Ordnance Department will furnish and install all electrical circuits and apparatus on carriages for *fixed* seacoast and antiaircraft guns; the Corps of Engineers will prepare structural features of the emplacement to accommodate such circuits.

c. **PORTABLE LAMPS.** The Corps of Engineers will furnish and install portable lamps required on fixed gun carriages; however, the Ordnance Department will supply the on-carriage connection.

d. **CIRCUITS.** When electric lighting or power circuits are to be installed at any fortification, the harbor defense commander will be notified beforehand of construction work involving circuits or apparatus for which other services are responsible.

e. PLANTS. Approval of the Chief of Ordnance and the Chief of Engineers will be required to increase the load on any fortification electric plant beyond that planned when the plant was installed; to transfer the load or any essential part of it; or to make any change in electrical connections. Posts with a fortification electric power plant large enough to supply current for lighting post buildings and grounds may use it for that purpose when authorized by the Chief of Engineers and the Chief of Ordnance; but fortification power and light needs will take precedence over post lighting or power. When a fortification electric plant is used jointly as above, the Chief of Engineers will provide funds for fuel and oil to operate it, and for necessary conduits, service wiring, and accessories to deliver current to post buildings and exterior lights, including meters, transformers, and equipment for repair, maintenance, and operation.

f. SPARE PARTS. Spare parts for fortification power plants and 25-kilowatt generator sets furnished and installed by the Corps of Engineers will be supplied in accordance with AR 100-20 and instructions issued by OCE. The Ordnance Department or Signal Corps will furnish spare

parts for power plants which they provide. Power cable, standard Corps of Engineers lighting fixtures, and spare parts for power equipment carried in engineer depot stock will be obtained by the post engineer on requisition, subject to necessary adjustment of funds. Equipment not carried in engineer depot stock will be procured with funds available for replenishing depot stocks, as directed by the Chief of Engineers. Spare canisters for collective protector units will be furnished by the Chemical Warfare Service on requisition by the commander concerned.

2.61. Discontinuance of Fortification Elements

The Chief of Staff, on recommendation of the defense commander and the Commanding General, ASF, makes the final decision on disposition of all fortification elements built by the Corps of Engineers and carried on the records of the Corps of Engineers as part of the fortification system.

The post engineer will maintain seacoast defense batteries and necessary structures which are eliminated from the harbor defense project as no longer necessary, but which are to be kept in use for storing seacoast-defense matériel,

CHAPTER 3

ROADS AND GROUNDS

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. Airfield pavements	3.1-3.8	58
II. Roads and walks	3.9-3.15	60
III. Paving materials	3.16-3.17	62
IV. Railroads	3.18-3.26	63
V. Snow removal and winter maintenance ..	3.27-3.29	65
VI. Grounds	3.30-3.43	66
VII. Refuse collection and disposal	3.44-3.54	71
VIII. Control of insects and rodents	3.55-3.65	73
IX. Passive protection	3.66-3.69	77

CHAPTER 3

ROADS AND GROUNDS

Section I. AIRFIELD PAVEMENTS

3.1. General

Keeping runways and landing fields in condition for safe use at all times will take priority over all other post engineer maintenance at AAF stations. Runway pavements should be inspected daily and immediate repairs made on areas showing any scaling, raveling, checking, or settling.

3.2. Extensions and Additions

When extensions or additions to airfield pavements are to be *permanent* in nature, design analysis for the improvements will be submitted to OCE. Applicable design criteria will be followed, regardless of funds used for the work. When repairs and utilities funds are to be used, the commanding general of the air force or AAF command will decide whether the post engineer will do the work. If the post engineer is not able to perform the proposed work, assistance of the appropriate division engineer will be requested.

3.3. Patching

Load capacity of pavement patches should not materially exceed the *designed* strength of the original construction. Patching materials should be similar in character to materials originally used in the pavement.

3.4. Joints in Concrete Pavements

Because the poured bituminous joint fillers used in building many concrete pavements perform unsatisfactorily, resealing or completely replacing poured joints will be necessary in a number of cases. However, the need for removing and re-

placing any large amount of filler should be investigated carefully before approval; whenever possible, less expensive alternate methods should be used. Using light grades of bituminous material to reseal existing joints instead of replacing them should be considered even if resealing would have to be repeated yearly. The expected period of Army use and the possible deteriorating effects of slight leakage into the base and subgrade should affect the decision.

3.5. Cleaning Airfield Pavements

To prevent damage to aircraft tires by stones, metal scraps, and other debris, airfield pavements must be cleaned and policed frequently.

3.6. Airfield Marking

a. RUNWAYS AND TAXIWAYS. (1) *Funds*. Repairs and utilities funds can be used for all initial marking and remarking of runways and taxiways, unless the work is part of construction or reconstruction of airfield pavements for which construction funds are used. Requests will be processed in accordance with current instructions for repairs and utilities projects; however, the commanding general of the air force or AAF command will first decide which airfields need numbering and marking. All costs in connection with initial marking and remarking of pavements will be charged to appropriate direct-cost accounts; no part will be charged as new work.

(2) *Performance*. Because this work must be closely coordinated with flying activities and pavement-maintenance operations, as much of it as

possible should be done by purchase and hire so the post engineer can supervise it closely.

(3) *Numerals and symbols.* New numerals, bars under numerals, and length symbols will not be placed until the old numerals need repainting. Then, new numerals and length symbols will be painted to comply with current standards. Obsolete pavement markings which are not masked out by the new stripings, numerals, and symbols should be obliterated only enough to eliminate confusion or conflict with the revised marking pattern.

(4) *Omission of standard features.* If the commanding general of an air force or AAF command does not think complete field markings is necessary for flying operations, standard numerals, symbols, stripings, or delineators may be omitted. Substituting nonstandard numerals, symbols, stripings, or delineators is not authorized. The commanding general of air force or AAF command will choose between alternate types of taxiway delineators, such as reflector disk as against applied reflector material.

(5) *Apron marking.* Taxiway markings may be continued through or along one edge of an apron if the commanding general of the air force or AAF command concerned considers it necessary. However, marking should not be used merely to indicate aprons.

b. HAZARDS. Any hazardous condition of pavements or other areas used by aircraft will be plainly marked.

(1) *Small areas.* Small holes, soft spots, etc., on the usable portion of airports will be marked with yellow flags or yellow pyramids by day and with red lights by night to warn incoming pilots that those spots are unsafe for landing.

(2) *Large areas.* When relatively large areas are unsafe for landing, they will be outlined with yellow flags by day and with red lights by night. A large cross will be set in the approximate center of the area, using yellow flags or strips of yellow cloth by day and red lights at night.

(3) *Closed runways.* When a well-defined runway is closed, a large cross of yellow flags or

yellow strips of cloth will be placed at each end during daylight hours. At night, red lights in the form of a cross will be placed at each end of the runway, making certain that enough lights are used for the cross to be clearly distinguishable.

Note. Crosses must be large enough to warn visiting pilots that the area or runway is unsafe. A large number of individual markers will not be used, as they would make it impossible for a pilot to determine precisely which area is to be used and which avoided.

3.7. Failures

Summary reports will be prepared for each *major* failure of pavements at airfields constructed by the Corps of Engineers for use by AAF. They will not be prepared for *minor* pavement-surface failures such as raveling or spalling, or where re-sealing only is required. Reports will also be submitted if the pavement has shown signs of severe overstress, though actual failure has not occurred. The division engineer concerned will be responsible for arranging preparation of these reports and for assembling and submitting two copies to OCE and one copy to the Waterways Experiment Station, Vicksburg, Mississippi.

3.8. Leased Airfields

a. MAINTENANCE. The extent of War Department responsibility for maintenance and repair of flying fields and facilities at leased airfields depends on terms of the lease. Work for which the War Department is responsible is chargeable to applicable repairs and utilities funds, and may be done by a post engineer or by contract citing these funds. At airfields used concurrently by the Government, the lessor, and other tenants, maintenance and repair costs may be shared by the parties involved on a proportional basis.

b. CERTIFICATES OF NECESSITY. Repair, alteration, or improvement of runways, taxiways, aprons, and similar facilities does not require a Certificate of Necessity in accordance with Public Law 530, 77th Congress. (See par. 2.35.) Limitations of the Economy Act apply specifically to leased buildings and structures or parts of buildings and structures.

Section II. ROADS AND WALKS

3.9. Off-reservation Roads, Streets, and Highways

a. PUBLIC ROADS ADMINISTRATION. Normally, on certification by the Secretary of War, the Public Roads Administration will maintain and make essential improvements and repairs to access roads to posts, camps, stations, and leased or purchased auxiliary fields, ranges, and training areas, whether or not they are State, county, or municipal roads. (See Defense Highway Act of 1941, Pub. Law 295, 77th Congress, as amended.)

b. WAR DEPARTMENT. War Department funds can be used to repair public roads and streets in *emergencies* only, to insure safe passage of military traffic; only *essential* repairs can be made.

c. CLAIMS. Claims arising from damage caused by military vehicles on State, county, or municipal roads may be handled under procedures outlined in AR 25-20 or 25-25, or through the Public Roads Administration in accordance with section 10, Public Law 295, 77th Congress, as amended.

3.10. Public Roads in Military Reservations

a. ROADS NOT CLOSED OR CONTROLLED. Public roads which are in military reservations and which have not been closed or on which public traffic is not controlled by the post commander will be improved, repaired, or maintained by the responsible local unit of government; or the Public Roads Administration can be requested to finance the work as an access-road project in accordance with existing access-road procedure.

b. CLOSED OR CONTROLLED ROADS. Roads in military reservations can be improved or repaired with repairs and utilities funds if the post commander has closed or controlled public traffic on them, and if the War Department acquires a real-property interest in them. (See AR 100-61.)

c. EMERGENCY WORK. Repairs and utilities funds can be used for any essential emergent repairs to public roads in military reservations if the repairs are needed to insure safe passage of military traffic.

3.11. Emergency Assistance to State Highway Departments

a. WHEN PERMITTED. To prevent serious interruption of traffic on principal through highways and on access roads to military establishments and defense industries, commanding generals of service commands can lend to State Highway Departments for highway maintenance and snow removal any equipment, repair parts, and maintenance supplies under their control which can be spared temporarily from other less urgent military uses. Since such equipment is extremely critical and, in general, in constant use for direct military purposes, assistance must be limited to emergency situations involving war-connected needs. Therefore, this aid will be given only when the appropriate district engineer of the Public Roads Administration certifies to the commanding general of the service command that an emergency exists, and the commanding general of the service command determines that the military interest is directly affected by the emergency.

b. PROCEDURES. (1) *Equipment.* Service commands will lend equipment to State Highway Commissions on memorandum receipt. Commissions will be responsible for operating and maintaining the equipment and for returning it in substantially the condition in which it was received.

(2) *Repair parts and maintenance supplies.* Repair parts and maintenance supplies for equipment loaned to State Highway Commissions and for other equipment operated by the commissions will be loaned on memorandum receipt when repayment is to be in kind; if monetary repayment is to be made, parts and supplies will be sold to State Highway Commissions at not less than cost to the Government. If the commanding general of a service command has no equipment and spare parts available, the appropriate division engineer may be asked to make available additional supplies and equipment under his control.

3.12. Standards of Maintenance

a. ROADS. Continual maintenance of temporary type construction is regarded as a normal require-

ment. To the extent that temporary roads can, by intensive effort, be maintained in a usable condition at all times, their replacement with a permanent type of construction is at variance with established policy.

b. WALKS. To reduce tracking of mud into buildings, access walks from paved streets or sidewalks to buildings may be resurfaced with crushed stone, and timber footbridges may be built across deep ditches. Temporary walks should not be given bituminous surface treatment unless available aggregates require additional binder for stability and economical maintenance.

3.13. Leased Facilities

The certificate required by Public Law 530, 77th Congress (par. 2.35) is not needed for repair, alteration, or improvement of pavements in leased areas. Limitations of the Economy Act apply

specifically to leased buildings and structures or parts of buildings and structures.

3.14. Private Cemeteries Within Military Reservations

For policy on maintaining roads and walks at private cemeteries within military reservations, see paragraph 3.42*b*.

3.15. Manufacturing Plants

Repairs and utilities responsibility for maintaining roads, walks, and parking areas at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds includes sweeping, sprinkling, cleaning, snow removal, and repair. The operating service is responsible for maintenance at proof facilities. For a list of facilities to which this policy applies, see paragraph 1.9.

Section III. PAVING MATERIALS

3.16. Tests and Development Work

To facilitate and coordinate all special investigations, tests, research, and development work on bituminous materials and flexible pavement design, a Flexible Pavement Laboratory has been established as a branch of the Embankment, Foundation, and Pavement Division, U. S. Waterways Experiment Station, Vicksburg, Mississippi. A Rigid Pavement Laboratory has been established in the Cincinnati Testing Laboratory, Ohio River Division, Mariemont, Ohio, to do similar work on design and construction of rigid type

pavements. The laboratories will be equipped primarily to perform the functions outlined above; on request, they will also do routine testing for post engineers on a reimbursement basis.

3.17. Asphalt Procurement

The Corps of Engineers is responsible for specifications, determining requirements, providing funds, purchase, inspection, and storage and issue of solid asphalts, cut-backs, and emulsions for paving purposes. (See WD Procurement Reg. 603.)

Section IV. RAILROADS

3.18. Maintenance Responsibility

a. TRANSPORTATION CORPS. The Transportation Corps is responsible for operating and maintaining all railway equipment, for maintenance-of-way of all military railways, and for maintenance-of-way of utility railways at designated posts or at areas under direct control of tactical commanders where units of the Military Railway Service have been specifically assigned for the purpose.

b. CORPS OF ENGINEERS. The Corps of Engineers is responsible for new railway construction and maintenance-of-way of utility railways not covered in *a* above.

3.19. Railroad Maintenance Agreements

a. TRANSPORTATION CORPS. Except as indicated in *b* below, the Chief of Transportation is responsible for making traffic and operating agreements or contracts with rail carriers to move persons and property to and from points on Government-owned railroad tracks, and to and from other necessary points. These agreements or contracts will be executed by officers designated by the Chief of Transportation. Agreements or contracts which include provisions for maintenance or repairs of Government-owned railroad trackage will be coordinated with the Chief of Engineers before they are signed.

b. CORPS OF ENGINEERS. Officers designated by the Chief of Engineers will make contracts for track maintenance in connection with construction or acquisition. These contracts will be referred to the Chief of Transportation for approval of transportation matters at the same time that they are referred to the carriers concerned.

3.20. Rails and Track Materials

a. CENTRAL ALLOCATION BY OCE. Rail and track materials and equipment for projects built or maintained under direction of post engineers will not be centrally allocated by OCE without specific request through channels. The office issuing the requisition will issue confirming purchase orders and follow all rules governing purchase allocations.

b. REQUISITIONS. Requisitions are required for

all rail and track items. Requisitions for central allocation of rail and track materials will include information on weight of rail, length in linear feet, with or without fittings, number and size of turnouts, Controlled Materials Plan allocation symbol for accessories and turnouts, etc.

c. CHANGES OR CANCELLATIONS. Once purchase allocations are issued, cancellations or changes in quantities, capacities, types, grades, deliveries, etc., will be permitted only with approval of OCE. No changes will be made or authorized by Corps of Engineers field representatives.

3.21. Utility Railroad Maintenance Equipment

For information on utility railroad maintenance equipment, see paragraph 4.40.

3.22. Manufacturing Plants

Maintenance of track and track equipment is a repairs and utilities responsibility at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds; operation and maintenance of rolling stock and loading and unloading equipment are responsibilities of the operating service. For a list of facilities to which this policy applies, see paragraph 1.9.

3.23. Flagmen and Watchmen Service

a. FLAGMEN. Railroad-company flagmen required because of repairs to utility railroads will be paid from repairs and utilities funds available for maintenance and repair of real property.

b. WATCHMEN. Crossing watchmen perform duties which are related to normal railroad operation and, therefore, will be paid from available operating funds.

3.24. Changes in Rail Facilities

To help the Traffic Control Division, Transportation Corps, keep rail-facility maps current, the post engineer will submit maps to the service command transportation officer as soon as prac-

licable after changes in rail facilities are made. Maps will show in detail all additions, deductions, or relocations of trackage or other changes in rail facilities, and will indicate the number of linear feet of track changed.

3.25. Leased Facilities

Certificate in accordance with Public Law 530, 77th Congress (par. 2.35) is not required for leased-railroad repairs, alterations, or improvements. Limitations of the Economy Act apply specifically to leased buildings and structures or parts of buildings and structures.

3.26. Replacement of Substandard Rail

Unsuitable, light weight, or unmatched rail on

heavily used tracks at installations designated for permanent postwar use may be replaced by available quantities of new 75-pound ASCE railroad and accessories. Normally, this replacement program will be limited to running tracks, ladder tracks, and possibly some heavily used tracks of classification yards and receiving yards. Existing good rail 75 pounds or heavier will not be replaced. Only ties in poor condition will be replaced and such replacements will normally be made with creosoted ties. Tie plates will normally be used on running and ladder tracks. Reballasting should be held to a minimum. Projects for accomplishment of this work will be processed in accordance with paragraphs 1.63 and 1.66. Material requisitions for *all* projects will be approved by OCE.

Section V. SNOW REMOVAL AND WINTER MAINTENANCE

3.27. Responsibility

Snow-removal service is a repairs and utilities function.

3.28. Snow Removal at Landing Fields

The commanding officer of an airfield will be responsible for setting the standards for snow removal and winter maintenance at the field. Maintenance should be governed by the following standards:

- a.* In continental United States, snow will be removed from runways.
- b.* At Air Transport Command airdromes, work should be conducted so there will be little or no interruption in use of landing-field facilities.
- c.* At the discretion of the commanding officer

of the installation, airfield use may be suspended to permit efficient operation of snow-removal equipment.

d. In general, runways will be considered usable in emergency when the cleared area is 150 feet wide, and when snow banks within 100 feet of either side of the cleared area are no more than 3 feet high and are sloped at the edges adjoining the cleared runway.

3.29. Ice Alleviation

Minimum amounts of calcium chloride or sodium chloride may be mixed with aggregates to produce proper braking surfaces for airplane traffic. Alkalinity of sand-chloride mixtures may be reduced by solution treatment and by storing mixtures for 10 to 30 days before use.

Section VI. GROUNDS

3.30. General

a. **RESPONSIBILITY.** The post engineer's grounds-maintenance responsibilities include revegetation, renovation, fertilization, and grass mowing, and the use and care of all incidental maintenance equipment. Grounds-maintenance and dust- and erosion-control technicians on the staffs of service command engineers will supervise projects and assist in programs for maintaining and expanding vegetated areas and dust- and erosion-control work at class I, II, and IV installations. They will give technical assistance to class III installations when requested and will make technical inspections of class III installations to insure that prescribed standards, procedures, and policies are being followed. Service command engineers and AAF commands can get help from organizations such as the U. S. Department of Agriculture, U. S. Department of Interior, and State Agricultural Experiment stations in preparing plans, recommendations, and specifications for revegetation projects under consideration.

b. **LIMITATIONS.** Revegetation and dust- and erosion-control projects will not include work done merely as a contribution to *beauty*, convenience, comfort, or prestige. The level of work should be no higher than needed to keep property in serviceable condition. Civilian gardeners at class I, II, III, and IV installations will be paid from repairs and utilities funds when their work meets the "spartan simplicity" standard set in paragraph 2.1b, is necessary grounds maintenance, and is a part of the repairs and utilities responsibility of the Commanding General, AAF, or the commanding general of the service command. Under restrictions imposed by War Department economy directives, landscaping, grounds beautifying, maintenance of flower beds and greenhouses, and similar work are not proper charges against repairs and utilities funds. Expenditures will be made for revegetation and dust and erosion control only when the work is utilitarian and results in a net savings to the War Department.

3.31. Grounds-maintenance Personnel

To insure effective dust and erosion control and protect the War Department's investment in vegetative cover, experienced grounds-maintenance supervisors should be employed at AGF and AAF stations whenever warranted by the acreage of grounds to be maintained and the responsibility involved.

3.32. Street and Area Marking Signs

The post engineer is responsible for preparing, erecting, and maintaining street and area marking signs. Traffic-control signs and pavement markings will conform to provisions in TM 5-624 (when published).

3.33. Policing

a. **GENERAL.** General policing, such as picking up paper and cigarette butts, is not a grounds-maintenance responsibility of the post engineer under AR 100-80 and is not properly chargeable against repairs and utilities funds. Enlisted personnel and prisoner labor may be used for this work; where prisoners of war are available, they should be used to a maximum. (See pars. 1.33 and 1.34.)

b. **AIRFIELDS.** Grassed areas in airfields must be policed before mowing to prevent excessive damage to mowing equipment and the need for costly repairs. This is the post engineer's responsibility. (See AR 100-80.) Refuse and debris can best be removed from the airfield immediately after planting and before the surface is overgrown. These areas should be policed periodically as part of regular grounds-maintenance operations, with available prisoner labor and/or prisoners of war doing the work whenever possible.

c. **VEGETATED AREAS.** AR 100-80 makes the post engineer responsible for policing vegetated areas not near occupied buildings; debris such as rocks, wire, and lumber which would interfere with grounds-maintenance operations of mowing, soil-erosion control, drainage, etc., must be removed. Repairs and utilities funds can be used for this work.

3.34. Traffic Control

It is a responsibility of the post commander to prevent excessive grounds-maintenance costs arising from failure to enforce strict traffic discipline over aircraft landing fields and other areas of all posts where grounds coverage of grass or other treatment has been provided for dust or erosion control.

a. DISCIPLINARY MEASURES. To prevent these excessive grounds maintenance costs, the following traffic discipline control will be placed immediately in effect at all posts within continental United States:

(1) Restrict traffic to such designated traffic ways as runways, taxiways, roads, streets, trails, lanes, driveways, and walks that are provided.

(2) Designate such parking areas as may be necessary and restrict parking to those areas.

(3) Take such action as may be necessary to protect road shoulders, ditches, slopes, and areas having dust- and erosion-control treatment from damage caused by traffic.

b. SPECIAL EMPHASIS ON VEHICLES. The operation of vehicles over vegetated and other non-traffic areas which have been treated for dust- and erosion-control results in serious deterioration of the cover. Personnel engaged in the delivery and pick-up of supplies, coal, garbage, and waste will utilize hard-surfaced roads and streets which have been provided.

3.35. Burning

Burning grass or other vegetation destroys the vegetative cover, often increases the dust and erosion problem, and is generally wasteful, destructive, and hazardous. Timely mowing during the growing season will eliminate the need for burning over established vegetation. Decisions on the advisability of burning over individual areas should depend on whether established vegetation will be injured, as determined by the agronomist on duty at service command headquarters.

3.36. Hospital Grounds

The policy in paragraph 2.1*b* permits lawns and a minimum number of shade trees to be grown near ward and administration buildings at general and regional hospitals as designated by the War Department.

3.37. Athletic Fields and Parade Grounds

The post engineer can carry out revegetation projects on athletic fields and parade grounds as part of grounds maintenance when the work is utilitarian and will result in controlling dust and destructive soil erosion. However, unless arrangements can be made with post commanders to retire the area from active use long enough to insure satisfactory growth of plantings, repairs and utilities funds cannot be spent for such work.

3.38. Agricultural Lands

a. RESPONSIBILITY OF STATION COMMANDERS. Station commanders are responsible for the general management of the lands of the station used for agricultural purposes and for the disposition of crops grown thereon. Station lands not needed for military purposes may be authorized for use for producing foodstuffs and crops, subject to determination by the service command agronomist that such use will not create a dust-control problem. However, strict supervision of such lands will be exercised by station commanders to limit the growing of crops to anticipated local requirements.

b. REPAIRS AND UTILITIES RESPONSIBILITIES. The maintenance of trees, shrubs, grass, etc., utilized for the prevention of soil erosion, is a repairs and utilities responsibility. The furnishing of supplies, equipment, seeds, plants, commercial fertilizers, and simple hand tools needed in the cultivating, fertilizing, spraying, pruning, or harvesting of agricultural crops (including vineyards and orchards) other than those for soil erosion is not a repairs and utilities function. The cultivating, harvesting, or handling of agricultural crops other than those used in soil erosion is not a repairs and utilities function.

c. RELEASE FOR CROP PRODUCTION. Where practicable, land acquired by the War Department must be utilized for agricultural or grazing purposes in all cases where such use of the land will not interfere with its military use. Therefore, it is of the utmost importance that the War Department release as promptly as possible all acreage suitable for farming, grazing, and orchard purposes which is no longer absolutely necessary for training or other military purposes. Prior to declaring any lands to be available for agricul-

tural, orchard, or grazing purposes, post commanders will carefully consider the following factors:

(1) Considerable funds have been expended by the War Department in providing dust and erosion control necessitated by removal of vegetative cover over large areas. These control measures have included revegetation with perennial grasses and various methods of treatment with temporary covers, mulches, oil, and gravel blankets. The use of such areas for production of cultivated crops, such as corn, cotton, soy beans, tobacco, etc., would necessitate plowing and tillage, which destroys the dust-control measures and, in fact, creates dust- and erosion-control problems.

(2) The use of land for grazing purposes may create problems of fencing, stock water supply, and sanitation. The lessees or permittees who are to use the lands should be responsible for erection and maintenance of fences.

(3) At airfields, including those temporarily inactive, adequate clearances and protection against fire hazards must be maintained when lands are released.

d. LEASES TO PRIVATE INDIVIDUALS. Agricultural lands may be leased by the division engineer to private individuals under existing regulations and instructions, upon release by the post commander in accordance with c above. In such instances, the service command agronomist will assist in the evaluation of leasing proposals and determine if the proposed usage will create a dust-control problem.

3.39. Post Gardens

AR 210-10 provides for the establishment of post gardens for the production of vegetables for the command and for the cultivation of such gardens by troops. Post engineers are not responsible for the cultivation, maintenance, or harvesting of gardens, nor are repairs and utilities funds to be utilized for any activities in connection with gardens. Gardens for the production of foodstuffs are to be cultivated, maintained, and harvested by troops using nonappropriated funds in accordance with AR 210-50. However, grounds maintenance equipment of the post engineer needed in plowing and cultivation of post gardens may be made available for that purpose, provided such equipment is not required at that particular time for

the accomplishment of the regular post engineer repairs and utilities activities. The post engineer may be called upon to furnish technical assistance in the selection of adapted vegetable crops to be grown, in recommending fertilizer to be used, and in the selection of suitable garden sites. There are usually qualified personnel on the staff of the post engineer, such as the grounds maintenance supervisor, the post agronomist, or the grounds foreman, who, upon request, may render technical advice in connection with this work. See paragraph 1.58b for policy on furnishing simple hand tools for gardening operations.

3.40. Mowing Landing Fields

Vegetated landing fields at AAF stations cannot be satisfactorily maintained if close mowing practices like those used on lawns, parks, and golf courses are followed. Vegetative cover on a landing field should never be mowed shorter than 3 inches.

3.41. Manufacturing Plants

As part of their repairs and utilities responsibilities, post engineers are responsible for all maintenance of walks, grounds, woodlands, channels, anchorage ways, seawalls, walls, etc., on real property at all Chemical Warfare Service and Ordnance Department manufacturing plants.

3.42. Cemeteries

a. POST CEMETERIES. (1) *Selecting sites.* The criteria below will be a guide to selecting post cemetery sites at permanent posts; for additional information, see AR 210-500.

(a) *Topography.* Relatively level ground is preferred, with gentle pitch for drainage. Grass cover will not drain freely if pitch is less than 2 percent, unless soil is unusually porous.

(b) *Soil conditions.* Soil should be dry and well-drained, with water table at least 7 feet below existing surface. Sites showing rock outcrop should be avoided. Soil data or samples are required by AR 210-500; test pits should be dug to learn depth of water table and whether there is rock within 7 feet of surface.

(c) *Surroundings.* Isolated area is preferred, free from noise and distraction of post activities.

(d) *Accessibility and approaches.* Easy acces-

sibility is desirable. However, for economy of maintenance there should be only one approach.

(c) *Acreage.* Size should be based on estimated burial requirements. (See (2) below.) Post cemeteries should be planned for no more than 25 years of use.

(f) *Foliage.* Existing trees should be spaced openly throughout site. Root growth of densely concentrated trees would disturb graves.

(2) *Planning.* Proposals for post cemeteries will be submitted to OCE with a small-scale *key map* or *use map* of the entire post. The map will have enough detail to show the limits of areas already developed; areas will be labeled to show their use for housing, storage, warehouse area, training aids, motor-storage area, etc. Wherever possible, the map will indicate probable and/or possible expansions of present use areas and their relationship to the proposed cemetery sites. The Chief of Engineers will decide whether the site is suitable on the basis of future post development and will advise the post commander of his decision. A preliminary site layout plan will then be prepared and submitted to OCE for review and submission to the Office of The Quartermaster General. The plan will be detailed enough to show proposed location, size, and number of burial lots and blocks of lots, roads, utilities, etc.

(a) *Lots.* Lots will be 10 by 5 feet for enlisted men and civilians, and 12 by 12 feet for officers. No lot will be more than 200 feet from a turf path or road providing hearse access; this will limit the maximum size of a block. Roads, if any, will be 20 feet wide; turf paths used for maintenance will be 10 feet wide, with a 5-foot clearance to graves or blocks of graves on either side; if used only for pedestrians, turf paths between blocks of graves will be 5 feet wide. Topography will dictate the lay-out of blocks and roads; the latter will follow the existing terrain closely, avoiding construction of banks subject to erosion, and providing minimum grading but suitable drainage. There will be as few drainage structures as possible. Curving roads are desirable only if made necessary by existing topography and to avoid gradients in excess of 4 percent. Simplicity in lay-out and low maintenance cost are the most desirable criteria.

(b) *Post plot.* Sections of the post plot will be lettered consecutively: A, B, C, etc.; if it be-

comes necessary to increase the area, each additional section will be given the next letter in the sequence. Graves in each section will be numbered in sequence, starting with number 1.

Graves will be 5 feet deep. Special care will be taken to have graves aligned laterally and longitudinally, so headstones will line up. Headstones will be set on the center line at the head of the grave with the inscription facing the grave and with their upper portions 24 inches above the ground.

(3) *Maintenance.* The Chief of Engineers is responsible for operating and maintaining post cemeteries. This includes maintenance and care of grounds, walks, roads, drainage, and inclosing walls or fences; opening and closing graves; soil-erosion control; procuring and setting headboards; setting permanent headstones at graves; care of shrubs, trees, grass, and flowers; preparing budget estimates; and budgeting and distributing funds. The Chief of Engineer's responsibility also includes providing materials, operating supplies, and equipment needed to carry out the maintenance program.

b. PRIVATE CEMETERIES IN MILITARY RESERVATIONS. (1) *Reservations owned by United States.* The War Department will not acquire title to cemeteries within the boundaries of military reservations owned in fee by the United States, unless possession is essential to efficient operation of the reservation or traffic through the cemetery cannot be controlled otherwise. Commanding officers are responsible for protecting the cemetery by fencing, policing, and patrolling when necessary. There is no legal authority for spending money to improve such cemeteries; however, AR 210-10 makes the post commander responsible for insuring that the cemetery is kept clean and attractive. Under authority of AR 100-80, the post engineer will carry out this work, including maintenance necessary or incidental to upkeep of the cemetery, grounds, lawns, trees, shrubs, plants, roads, walks, drains, fences, and walls. Burning weeds and grass is undesirable as it will mar and deface tombstones.

(2) *Leased reservations.* In maintaining cemeteries in areas leased by the United States, the commanding officer should be guided by agreement among the interested parties. The commanding officer will provide protection for the

cemetery by fencing, policing, and patrolling when necessary.

c. NATIONAL CEMETERIES. Regulations for Government and care of National cemeteries are contained in National Cemetery Regulations, approved by the Secretary of War and published by The Quartermaster General. The Quartermaster Corps is responsible for maintenance and operation of National Cemeteries.

3.43. Underground and Overhead Utilities

Prior to the initiation of any work involving ex-

cavation or the movement of high or bulky loads, the persons responsible for such work will contact the post engineer to ascertain the location of any underground utilities in the vicinity of the proposed excavation and the vertical clearance of existing overhead utilities, and to obtain a permit. The post engineer will consult the post signal officer prior to the granting of such a permit. This policy emphasizes the need for accurate maps to be maintained by the post engineer and the post signal officer of their respective underground utilities and overhead lines.

Section VII. REFUSE COLLECTION AND DISPOSAL

3.44. General

Post engineers are responsible for collecting and disposing of all refuse and for collecting all salvage except that collected by contract or subject to accountability. They are not responsible for disposing of salvage. Service command refuse collection and disposal personnel are available to assist class I, II, III, and IV installations in—

- a. Determining the most suitable methods of collection and disposal,
- b. Organizing the collection systems,
- c. Selecting sanitary fill sites,
- d. Initial installation of sanitary fills and regulated dumps,
- e. Instructing refuse disposal operating personnel.

They will also inspect segregation, collection, and disposal operations periodically in accordance with established procedures.

3.45. Collections

Post engineer crews make systematic collections of salvage and refuse from pick-up stations. These stations are established by the post engineer with the approval of the commanding officer, and are the only places from which the normal daily accumulation of salvage and refuse are collected. Generating units or other personnel responsible for custodial services, are responsible for delivery of salvage and refuse to the pick-up stations and for proper segregation of materials in accordance with the requirements of the salvage program and the disposal systems. Organization commanders will take necessary steps to insure that all materials are segregated and placed in the designated containers. Improperly segregated materials will not be collected by the post engineer and a report will be made to the post commander for corrective action. Garbage and combustible materials will be collected daily. Other types of salvage and refuse will be collected as frequently as deemed necessary by the post engineer to prevent containers from becoming overloaded. Collections made by agencies other than those operating as a part of the post engineer's organized collection system are not

permitted and the refuse will not be accepted at the disposal facility, except on special permission from the post engineer. The post engineer will appoint a competent supervisor to be in charge of collections.

3.46. Disposal Facilities

All posts, camps, and stations must be provided with adequate refuse disposal facilities. The approved systems applicable to most posts are sanitary fill, incinerators supplemented by regulated dumps, and removal from the post. Burning pits, burn-and-cover systems, and garbage grinders are approved methods of disposal under special conditions. Open dumping of garbage and trash creates potential health hazards by providing rodents, flies, and mosquitoes with ideal places to live and multiply. Therefore, open dumping of garbage and combustible trash will not be permitted on military reservations.

3.47. Sanitary Fill

Because of its flexibility, low installation and operating costs, and low personnel requirements, the sanitary-fill system of refuse disposal should be installed in preference to building an incinerator. However, a sanitary fill will not be installed or operated if no suitable site is available or if soil or climatic condition make the required earth-seal covering uneconomical or impracticable. Sanitary-fill operation should follow closely methods outlined in TM 5-634 (when published). Variations are acceptable if refuse is compacted and covered each day, and if there is no burning.

3.48. Incinerators

Incinerator procedures should be organized with maximum efficiency to avoid the need for added incinerator or sanitary-fill equipment. Essential factors are: correct salvage procedures; eliminating, at the sources, incombustibles and excess water from refuse intended for incineration; well-scheduled deliveries of refuse to incinerator platforms; and good manual operation. Incinerators which are adequate for post requirements should

be kept in operation; another disposal method will be substituted only if the change will result in a worth while reduction in personnel and/or operating cost.

a. **OPERATION.** Methods of incinerator organization, operation, and maintenance will follow closely the instructions in TM 5-634. If a single shift of operating hours is insufficient, a system of staggered working hours will be used in preference to two shifts.

b. **SAFETY FACTORS.** Safety guardrails will be installed on all top-feed incinerators. After operating hours, rubbish must not be left on or delivered to the charging floor or loading platforms. Explosive or highly inflammable materials must not be delivered to or charged into incinerators.

c. **CONSTRUCTION REQUESTS.** Because of the peculiarity of incinerator construction, all requests for incinerator construction at class I, II, III, and IV installations will be forwarded to the Chief of Engineers, accompanied by detailed recommendations of the refuse collection and disposal section of the service command.

3.49. Dumps

Regulated dumps are used only for the disposal of debris and incombustible refuse at posts, camps, and stations where the material is not disposed of by sanitary-fill, burn and cover method, or removal from the post. Dumps may not be used to dispose of combustible trash or garbage. Regulated dumps will be kept as small in area as practicable. The preferred height of dump face is not more than 4 feet. Every month, loose materials will be compacted and covered with 12 inches of earth or ashes. All inactive open dumps will be effaced by compacting loose materials and covering them with 12 inches of earth or ashes. Procedures relating to dumps will follow closely instructions given in TM 5-634.

3.50. Removal from Post

Post engineers are responsible for arranging contracts for collecting and/or hauling refuse off post and/or for disposing of it off the reservation. Care will be taken that the ultimate disposal method will not create a public nuisance. Contracts or arrangements can provide that the Gov-

ernment pay the contractors, but arrangements must be in the best interests of the Government. Payment can be made from repairs and utilities funds.

3.51. Burning Pits

Masonry burning pits or three-sided earth revetments are adequate for refuse disposal at depots and similar installations; however, they must be approved by fire-prevention agencies.

3.52. Burn and Cover

At small installations, such as class A installations, prisoner of war branch camps, or installations having only a small station complement where the daily production of refuse is too small to warrant the expense of building a permanent incinerator or equipping the installation with motorized vehicles for operating a sanitary fill, an acceptable method of refuse disposal is to trench each day's refuse and burn it and to cover the residue weekly. This method is described in TM 5-634. While requests for adequate disposal facilities are being processed for posts other than small installations mentioned above, a modified system of burn and cover is acceptable as a temporary expedient. Under this system, refuse is burned daily and the residue effectively covered with earth at least weekly.

3.53. Garbage Grinders

Garbage grinders supplemented by incinerators or burn and cover system for trash are an adequate method of disposal at water-bound or similar harbor-defense installations.

3.54. Stands and Receptacles

Post commanders will require the appropriate supply agency to provide suitable receptacles for segregation of refuse and salvage into specific classes to meet the requirements of salvage regulations and of the collection and disposal systems. Clear markings will be placed near each container and not on the container to indicate the type of materials to be placed therein. All pick-up stations will be provided with suitable receptacle stands and receptacles as required in TM 5-634.

Section VIII. CONTROL OF INSECTS AND RODENTS

3.55. Responsibilities

a. MEDICAL OFFICER. The medical officer at a military installation will be responsible for—

- (1) Health of personnel.
- (2) Investigating the prevalence, distribution, and significant habits of insects, rodents, and other vermin.

(3) Recommending control measures and furnishing advice for the health and morale of personnel.

(4) Providing technical supervision when necessary to carry out control measures.

(5) Determining and reporting on adequacy of control or corrective measures.

b. POST ENGINEER. To preserve property and protect health and morale, the post engineer will be responsible for eradicating or controlling insects, rodents, and other vermin in real property. (See AR 35-6520.) He will perform this work under direction of the post commander, and in accordance with recommendations of the Medical Department; the Medical Department will provide necessary technical supervision and inspection of the work. The work will include:

(1) Construction and maintenance such as screening, draining surface water, ditching, filling, dispersing insecticides and rodenticides on grounds and in buildings, and fumigating buildings and commodities.

(2) Procuring, purchasing, storing, and issuing all specialized supplies and equipment normally supplied by the Corps of Engineers for pest control or eradication.

c. QUARTERMASTER SUPPLY OFFICER. The quartermaster supply officer will store and issue standard supplies for insect and rodent control for use by troops, individuals, and post engineers. Standard supplies include those used in barracks, mess halls, kitchens, bakeries, laundries, storage warehouses, depots, and similar facilities; on grounds; for clothing and equipage; and for personnel listed in AR 40-205, 40-210, 100-80, and TM 5-632.

3.56. Material and Equipment

a. GENERAL. Material and equipment author-

ized for use by the post engineer in pest control or eradication will be obtained by requisition on the service command engineer or by local purchase as directed by the service command engineer.

b. TYPES. Authorized material and equipment includes:

- (1) Paris green, 5-pound can.
- (2) HCM discoids or fumigants.
- (3) Duster, pest exterminator, powder, rotary type, including spare parts.
- (4) Sprayer, insecticide, knapsack cylinder type, 3-gallon capacity.
- (5) Sprayer, insecticide, portable piston pump, gasoline-engine driven, 1 to 3 gallons per minute.

3.57. Fly Traps

In accordance with recommendations of The Surgeon General and The Quartermaster General, the Chief of Engineers is responsible for the design, procurement, distribution, and installation of fly traps at posts, camps, and stations. Type A-1 fly traps (sketch No. 52) may be built by the post engineer or procured by local purchase. The post surgeon will recommend allowances and locations of fly traps on the basis of sanitary regulations and local conditions. Fly traps should never be placed inside buildings.

3.58. Handling HCN Discoids

The storage and issue of HCN discoids used in disinfestation of buildings and commodities is the responsibility of the post engineer.

a. PRECAUTIONS. Careless storage or handling of cans containing hydrocyanic acid is to be avoided, as the gas produced on exposure to air is lethal. Gas masks with HCN canister must be provided when handling leaking cans. (See par. 5.69, for requisitioning procedure for obtaining gas masks and canisters.) Regular inspections of storage conditions should be provided by the post chemical officer or his authorized representative.

b. DISPOSITION OF EXCESSES. As HCN discoids are purchased locally as needed, small stocks of this item will often be on hand and will have to be disposed of when the installation is placed

in a surplus or inactive status. Whenever possible, the service command engineer should transfer excess cans to active installations where they are needed for fumigation. If transfer to an active installation or disposal by sale to authorized individuals is not feasible, HCN discoids will be destroyed by Chemical Warfare Service. Arrangements should be made with the Chemical Warfare Service officer in each service command for shipment of these discoids to a designated point for destruction. Cans of discoids are not to be sold to unauthorized individuals for use as a fumigant or transferred to a salvage officer under any circumstances. Disposal outside the War Department will be made *only* upon approval of the service command engineer, the service command surgeon, and the service command chemical warfare officer.

3.59. Manufacturing Plants.

Post engineers are responsible for all insect and rodent control on real property at industrial sections of Chemical Warfare Service and Ordnance Department Manufacturing Plants. For a list of facilities to which this policy applies, see paragraph 1.9.

3.60. Army Property in Storage

Post engineers will assist storage officers in periodic fumigation of depots and warehouses or in other methods of controlling insects and rodents which might damage or destroy Army supplies. Storage officers will inspect stocks of supplies and property frequently, and will secure the assistance of post engineers when necessary. To insure that proper safety precautions will be taken, post engineers will request technical assistance from the entomologist on duty at service commands before initiating a program of fumigation.

3.61. Cooperation of Other Agencies

Specialists from the Fish and Wild Life Service, Department of Interior, will help post engineers control or eradicate rodents and predatory animals which are a menace to health or are destroying public property. Specialists from the Bureau of Entomology and Plant Quarantine, Department of Agriculture, will offer consultation and guidance in controlling termites, Japanese beetles, and grasshoppers. Requests for services of these

specialists at class I, II, III, and IV installations will be made to the commanding general of the service command.

3.62. Property Near Military Reservations

Responsibilities of the War Department and the Public Health Service for pest control on property adjoining or near military reservations are covered in a joint memorandum dated 22 December 1943. Details of the memorandum are discussed below.

a. GENERAL. If the incidence of insects, rodents, or vermin on private property adjoining or adjacent to military reservations constitutes a *menace* to the health of military personnel, control measures are the responsibility of the U. S. Public Health Service. However, if insects, rodents, or vermin are *nuisances* only and interfere with the training program of troops in off-post areas, Public Health Service funds cannot be utilized for control.

b. U. S. PUBLIC HEALTH SERVICE. (1) If it is believed that the incidence of insects, rodents, or vermin in an extra-military area constitutes a *menace* to the *health of the command*, the post commander may submit a request through service command or AAF command for a survey of the area by the Public Health Service. If it is determined that a *health hazard* exists, the Public Health Service, acting under agreement between the Secretary of War and the Federal Security Administrator, will undertake the necessary work at its own expense.

(2) If pest mosquitoes, rodents, or other vermin do not constitute a significant *health hazard* in an extra-military area, but the post commander finds that they *interfere materially with the training program of troops*, he may submit a request through service command or AAF command for the Public Health Service to carry out the control program subject to reimbursement from funds available for mosquito-control work under the appropriation Engineer Service, Army. The post commander's request will be accompanied by a full report on conditions, including the extent and seriousness of interference with or effect on the troop training program. No control project of this nature will be carried out until a survey of the work to be done and an estimate of its cost are made jointly by representatives of the Public

Health Service, the post engineer, and the post surgeon.

c. **POST ENGINEER.** If the conditions in *b*(2) above, exist and the Public Health Service informs the service command or AAF command that it is *not* available for carrying out the desired control measures, the post commander may direct the post engineer, by a signed copy of WD AGO Form 5-25, to accomplish the necessary control measures, using funds available for mosquito-control work under the appropriation Engineer Service, Army. No control project of this nature will be carried out until a survey has been requested and made as outlined in *b*(2) above. Before the post engineer enters an extra-military area to carry out control measures, a written agreement providing for right of entry and waiver of claims will be entered into with the private land owner.

d. **LIMITATION OF EXPENDITURES.** (1) No projects mentioned in *b*(2) and *c* above, which involve the expenditure of \$10,000 or less will be begun without approval of service command or AAF command. Approval for projects estimated to cost more than \$10,000 will first be secured from the Chief of Engineers for class I, II, and IV stations and the Commanding General, AAF, for class III stations. The Chief of Engineers or the Commanding General, AAF, will coordinate the project with The Surgeon General.

(2) No more than 20 percent of the funds available in each service command or AAF command for insect and rodent control will be spent on new control measures or maintenance of existing measures in extra-military areas without prior approval of the Chief of Engineers for class I, II, and IV stations and the Commanding General, AAF, for class III stations.

e. **MAINTENANCE OF CONTROL MEASURES.** If the Public Health Service performs control measures outlined in *b*(1) above, any necessary recurrent maintenance is a responsibility of that service. However, if control measures are executed as in *b*(2) above, necessary recurrent maintenance will be performed by the Public Health Service, if available, subject to reimbursement; otherwise, they will be carried out by the post engineer at the direction of the post commander. The post engineer is responsible for recurrent maintenance of control measures which he performs.

f. **REIMBURSEMENTS.** The War Department will reimburse the Public Health Service for control operations which that service undertakes under provisions of *b*(2) above, by means of Standard Form 1080, supported by the joint memorandum of 22 December 1943.

3.63. Insecticide DDT

a. **INFORMATION CONCERNING ITS USE.** Tropical Disease Report 19, prepared by the Committee on Medical Research of the Office of Scientific Research and Development gives the status of knowledge concerning the use of DDT as an insecticide. Copies may be obtained through Medical Department channels.

b. **FIRE PRECAUTIONS IN HANDLING DDT.** See paragraph 6.69.

3.64. Airplane Spraying of DDT

a. **GENERAL POLICY.** DDT distributed over the country-side not only wipes out mosquitoes but also may kill other insects, many of which are beneficial. Much still must be learned about the effect of DDT on the balance of nature important to agriculture and wild life before general outdoor application of DDT can be safely employed in continental United States. For these reasons, all projects to control mosquitoes or other insects on military installations in the continental United States by airplane application of DDT will be reviewed and approved as outlined in *b* below, prior to being initiated. Operations in extra-military areas are the responsibility of the United States Public Health Service.

b. **APPROVAL OF PROJECTS.** Commanders of military installations in the continental United States who believe that mosquito control in their commands might be improved or materially facilitated by the spraying of DDT from aircraft will request approval from the Army Committee for Insect and Rodent Control, 1818 H Street, NW, Washington, D. C., through military channels. The request will include the following information:

(1) Location, size, and description of area proposed to be sprayed.

(2) Data provided by a preliminary survey by qualified entomologists and biologists indicating nature of the insect problem present; possible im-

portance in disease transmission; possibilities of damage to plant or animal life from the proposed operation.

(3) Description of other insect control measures carried out or proposed for the same area.

(4) Recommended schedule of application of DDT as indicated by data obtained on survey. (See (2).)

(5) Amount of DDT available for the project, and supplementary amounts to be requisitioned at appropriate intervals.

(6) Description of airplane and spraying device available or that can be made available to the project.

(7) Summary of arrangements made in regard to the project with other agencies, such as Army Air Forces, Corps of Engineers, Malaria Control in War Areas, United States Public Health Service, Fish and Wild Life Service, Department of the Interior, and the Department of Agriculture.

c. ADVICE OF DEVELOPMENTS. Post commanders will advise the Army Committee for Insect

and Rodent Control of significant development during the course of any approved project and will, upon completion of a project, submit statement of results including the effectiveness of the project as shown by entomological surveys made before and after spraying.

3.65. Qualified Personnel

In order to carry out insect- and rodent-control measures effectively and to observe safety precautions in handling poisonous insecticides, rodenticides, and fumigants, qualified and properly trained supervisors, foremen, and laborers should be employed. Post engineers should employ personnel to include a pest control supervisor and the recommended number of foremen and laborers at posts, camps, and stations whenever warranted by the acreage of grounds and the number of buildings. At all installations a responsible member of the post engineer's staff should be designated as pest control supervisor and should properly coordinate the work with the post surgeon.

Section IX. PASSIVE PROTECTION

3.66. Definition

Passive protection is that form of defense designed to impede enemy attack by land, sea, or air, by practical strategic measures not requiring active military operations to insure effectiveness. Passive protection includes such measures as dim-out, blackout, air raid warning systems, control of radio, tone-down painting, camouflage or protective obscurement, structural protection, personnel shelters, dispersion, and all like measures pertaining to facilities and installations, but does not include action necessary to effect the provisions of Executive Order 9066, 19 February 1942, or control of serial photography and flying.

3.67. General Requirements

All requirements for passive protection have been rescinded and all passive protection measures, other than those required for training purposes, may be demobilized in accordance with paragraph 3.68. In this demobilization, camouflage and tone-down painting are considered as appurtenances to real estate. The provisions of paragraph 3.68 will not apply to grass, legumes, or other vegetation necessary to provide erosion- or dust-control measures, or to the removal or obliteration of camouflage and tone-down painting, at War Department installations, except where necessary for proper maintenance.

3.68. Removal of Passive Protection

a. PRIVATE FACILITIES. At privately-operated facilities where the War Department is legally obligated to provide for removal of passive pro-

tection measures, passive protective measures have been determined to be surplus under the provisions of Procurement Regulations 7 and will be demobilized. Such passive protection measures will be reported direct to the appropriate division engineer for disposition in same manner as leased facilities. The division engineer will accomplish the removal, or make settlement in lieu thereof, in accordance with the provisions of contracts or then current instructions and procedures promulgated by the Chief of Engineers. At privately-operated facilities where the War Department is not legally obligated to provide for the removal of passive protection measures, removal will be the responsibility of the individual owners and will not be accomplished at the expense of the Government. Removal of such measures, not heretofore removed, if any, may be accomplished without specific approval of military authority.

b. WAR DEPARTMENT INSTALLATIONS. Passive protection measures at War Department field installations have been determined to be surplus under the provisions of Procurement Regulations 7 and will be demobilized. Such passive protection measures will be reported direct to the appropriate division engineer and removal will be accomplished in accordance with then current instructions.

3.69. Training Projects

Passive protection measures continued for training purposes will be considered as training aids and the post engineer's responsibility therefor will be governed by paragraph 2.51.

CHAPTER 4

SHOPS, SERVICES, AND EQUIPMENT

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. Shops	4.1—4.10	80
II. Furniture	4.11—4.19	83
III. Packing and crating	4.20—4.21	86
IV. Custodial services	4.22—4.24	87
V. Mess and installed equipment	4.25—4.30	89
VI. Outside maintenance tools and equip- ment	4.31—4.48	92

CHAPTER 4

SHOPS, SERVICES, AND EQUIPMENT

Section I. SHOPS

4.1. Integrated Maintenance Shops

Operation of maintenance activities under the integrated maintenance plan is optional at class I and II installations at the option of the commanding general of the service command. The operation of presently established integrated shops at class IV installations will continue under instructions of the Commanding General, ASF. Unless otherwise directed by the Commanding General, AAF, integrated maintenance activities will continue at class III installations under the integrated maintenance plan as directed by current AAF regulations. At installations occupied jointly by the Army Service Forces and the Army Air Forces, or where dual responsibilities or facilities exist, the commanding general having command jurisdiction of the installation is responsible for the operation of the maintenance shops; except that at ASF installations, facilities used for the maintenance of equipment peculiar to AAF are the responsibility of the Commanding General, AAF. Post engineer shops are excluded from integrated shop plans except that post engineers will perform miscellaneous maintenance, repair, and fabrication functions in accordance with paragraph 4.5.

4.2 Establishment

Adequate shops and warehouses are essential to proper performance of post engineer duties. At most stations, these facilities are now available to a reasonably adequate degree. TM 5-611 (when published) lists schedules of shop, warehouse, yard, and other space considered necessary for post engineers at stations of various classes and

sizes. Activation of maintenance shops or sub-shops at class IV installations requires prior approval of the Commanding General, ASF.

Providing appropriate equipment and shop practices is as important as sufficient space.

4.3. Shop Equipment

When small tools and other portable equipment needed for repairs and utilities work are not available from excess lists, they will be purchased locally from funds available to post engineers. Heavy utility shop equipment and portable equipment purchased centrally by OCE are listed in the Equipment Manual for Area and Post Engineers; this equipment is stocked in division engineer warehouses and is available on requisition. In addition, special equipment for which a general need may exist from time to time can also be made available through central procurement by OCE or through service command procurement. Requisitions for centrally procured items to be used within the service command will be prepared by post engineers on WD AGO Form 445 for initial issue, replacement, or justified special purposes; they will be submitted through channels to the commanding general of the service command, attention service command engineer, for approval and supply. The requisition will include a complete statement covering: basis for requisitions; housing capacity of post, camp, or station; justification; how and where equipment is to be used; and complete information necessary for technical review. The service command engineer will edit requisitions; when they are approved, he will forward them to the division engineer warehouse for supply. If justified requisitions for standard

and nonstandard items of heavy utility shop equipment cannot be supplied from stock on hand, due in, or earmarked, they will be forwarded to OCE for action, accompanied by the service command's recommendations.

4.4. Shop Stocks

Post engineers may store in a repairs and utilities shop all or a portion of the station stock of those items used by the shop in its operations when extenuating circumstances are such that these stocks cannot be stored in a central warehouse. The items of station stock so stored will not be construed as constituting model shop stocks within the meaning of TM 38-403. Items carried as shop stock will be considered as a part of, and not in addition to, regular stock. Details concerning accounting for shop stocks are contained in TM 5-601 (when published).

4.5. Miscellaneous Maintenance Repair and Fabrication by Post Engineer Shops

a. POST ENGINEER SHOPS. Post engineers at all class I, II, III, and IV installations, including regional post engineer shops not located at a post, camp, or station, will upon request accomplish, without reimbursement, miscellaneous maintenance and repair of equipment and the fabrication of nonstandard items of furniture and nonstandard items of equipment within the scope and capacity of their repairs and utilities shops, with repairs and utilities materials normally available, using repairs and utilities funds available locally, *provided:*

(1) *Fabrication.* (a) The item to be fabricated, or an acceptable substitute, cannot be obtained within the required time, through normal supply channels, or procured through normal procurement channels by the requesting agency. The item fabricated will be limited to the simplest and most inexpensive type, sufficient only to meet the requirements of the using agency.

(b) The post commander personally approves in writing the necessity for fabrication of the item.

(c) The work is a proper charge against War Department appropriations available to the installation where the work is to be performed.

(d) The project is approved in accordance with AR 100-80.

(2) *For Maintenance.* (a) The item to be repaired is considered by the post engineer to be economically repairable.

(b) The work is a proper charge against War Department appropriations available to the installation where the work is to be performed.

(c) The maintenance performed is within the provisions of paragraph 2.1b.

(d) The project is approved in accordance with AR 100-80.

b. SUPPLIES AND SPARE PARTS. In accomplishing the above-defined work the post engineer will use repairs and utilities materials normally available in post engineer shops with the following exceptions:

(1) *Fabrication* (as defined in par. a(1) above). Any required supplies and spare parts *not* normally stocked by the post engineer will be furnished by the agency requesting the work.

(2) *Repair.* Any required supplies and spare parts *not* normally stocked by post engineers will be furnished by the agency responsible for maintenance.

c. WORK ORDERS. A file of orders for fabricated items will be maintained by the post commander for periodic inspection by a disinterested commissioned officer, normally from The Inspector General's Department, to be designated by the commanding general of the service command, ASF, or the commanding general of the air force or AAF command to determine that a satisfactory control is exercised.

d. BEYOND CAPACITY OR SCOPE OF POST ENGINEER SHOPS. When required maintenance, repair, or fabrication of any item is beyond the capacity or scope of the post engineer's facilities and the other shops available to the installation, the item will be evacuated to the appropriate higher echelon shops in normal manner.

e. ACCOUNTABILITY. Items of equipment fabricated in a post engineer or other shop, whether standard or nonstandard, will be listed upon a shipping ticket or other appropriate form when released to the requisitioning agency. A receipt will be obtained for the property, and the receipted copy of the shipping document, together with related copies of work orders, filed as now prescribed. Shipping documents covering fabricated

property received by the requisitioning agency will be assigned voucher numbers to regular stock record account, and the equipment picked up in the accountable property records.

4.6. Shops at Class IV Installations

To avoid duplications and insure economy of maintenance facilities and personnel, no new maintenance shops or subshops will be activated at class IV installations within service commands and no existing shops will undergo major expansion until authorized by the Commanding General, ASF.

4.7. Manufacturing Plants

Where the activity is primarily industrial, the operating service is responsible for operating maintenance and utilities shops and maintaining installed equipment at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds. Where the activity is primarily for general post purposes, operation of maintenance and utilities shops and maintenance of installed equipment is a repairs and utilities responsibility of the Corps of Engineers. Separate shops will be provided only when justified by a large amount of nonindustrial use. For a list of facilities to which this policy applies, see paragraph 1.9.

4.8. Used Shop Tools and Equipment

Used shop tools, machinery, and equipment other

than controlled items may be purchased by post engineers within limitations defined in AR 100-80; there is no objection to purchasing second-hand tools so long as they are satisfactory for their intended use.

4.9. Key Making Facilities

As custodian of all post buildings and structures, the post engineer is responsible for the provision of keys needed for necessary protection of such buildings and structures. This does not necessarily mean that the post engineer need establish elaborate key-making facilities when outside contractual facilities are available. Where the post engineer operates key-making facilities, post engineers may utilize such facilities to make keys for organizational equipment, provided blank keys and a serviceable key are furnished by the organization desiring the service. Post engineers do not have facilities to fit a blank key to a lock in organizational equipment for which no key or an improperly fitted key exists. Keys made by post engineer facilities or issued by post engineers for buildings and structures will be handled as memorandum receipt property under the provisions of TM 5-601 (when published).

4.10. Electric Fans

Procurement and distribution of new portable electric fans is prohibited. However, distribution of existing depot stocks is not affected by this policy.

Section II. FURNITURE

4.11. Definition

The term *furniture* as used in this manual includes those items of Government-owned furniture authorized for equipping officers' quarters, noncommissioned officers' quarters, barracks and quarters for enlisted and other military personnel, approved civilian quarters, offices, hospitals, and all other War Department buildings and structures at posts, camps, and stations except furniture for Army transports, which are maintained by the Transportation Corps.

4.12. Procurement

a. FURNITURE. The Procurement Assignment Board has assigned procurement responsibility for specific items of furniture to certain technical services. (See app. 1, WD Procurement Reg.) The Corps of Engineers is *not* assigned any procurement responsibility for furniture.

For the duration of the war, procurement of wall lockers and all heavy furniture for officers', warrant officers', and noncommissioned officers' quarters is suspended. Furniture for troop housing is listed in T/A 20, and is obtained by requisition through the Quartermaster Corps. Furniture for enlisted men's day rooms and recreational rooms and for officers' clubs and officers' day rooms are to be purchased from nonappropriated funds. (See AR 210-50.) Portable furniture for domestic post offices at posts, camps, and stations within continental United States is furnished by the Post Office Department and procured from funds in an allotted status at quartermaster regional supply depots.

b. SPARE PARTS. Regardless of whether furniture is to be repaired by purchase and hire or by contract, necessary spare parts will be procured with available funds by the technical service responsible for procuring the item to be repaired. The post engineer may fabricate spare parts for furniture and wall lockers if they are not available upon requisition or by local procurement.

4.13. Local Manufacture

For policy governing local manufacture of furniture, see paragraph 4.5.

4.14. Maintenance Responsibility

a. GENERAL. Maintenance, alteration, and repair of furniture are repairs and utilities responsibilities. Commanding generals of service commands (for class I, II, and IV installations) and air forces or AAF commands (for class III installations) will be responsible for supervising this work as part of their repairs and utilities responsibilities. (See AR 170-10, 100-80, and WD Cir. 388, 1944.)

b. SPECIAL EQUIPMENT. Repairs and utilities is not responsible for maintenance and repair of special equipment peculiar to any service, unless the responsibility is specifically assigned.

c. LEASED FURNITURE. The post engineer may use repairs and utilities funds to repair furniture leased with a building. If the lessor furnishes services including maintenance and operation, the post engineer is not responsible for repairing damages to leased furniture in excess of ordinary wear and tear, damages by the elements, and damages resulting from circumstances over which the Government has no control. The Government is responsible for damages due to negligence or the commission of waste. In every case, the extent of the Government's liability should be determined from the lease agreement for the building.

d. CRITICAL ITEMS. There will be no restriction on repairing furniture or wall lockers listed in SB 38-1 as being in a critical supply status.

4.15. Repair

a. AT STATION LEVEL. The post engineer will repair only furniture which is in use or currently needed for use at the station and for which he has facilities, materials, and personnel available. Furniture for depot stock will be repaired in accordance with instructions issued by commanding generals of the service command (for ASF depots and depots under chiefs of technical services) and of the air technical service command (for air technical service command depots). Post engineers will not repair furniture which they considered to be beyond economical repair. Such furniture will be disposed of through salvage.

b. PERFORMANCE OF REPAIRS BEYOND AVAIL-

ABLE FACILITIES AT STATIONS. Unserviceable furniture not currently needed for use, or that requiring repairs beyond the capabilities of available post repair facilities or personnel, will be reported by the installation commander to the commanding general of the service command for class I, II, and IV installations and to the commanding general of the air force or command concerned for class III installations. These commanders will furnish necessary instructions to effect repairs of unserviceable furniture utilizing facilities provided by the service command engineers.

c. DISPOSITION OF NONREPARABLE AND REPAIRED FURNITURE. If the service command engineer determines that unserviceable furniture reported to him for repair is not repairable, he will request the appropriate air force command or the service command concerned to issue disposal instructions. When unserviceable furniture is shipped to the service command engineer for repair, the installation commander is responsible for furnishing, at the time of shipment, the applicable instruction for disposition upon completion of repair, as indicated below:

(1) Return to consignor.

(2) Report as excess to the specific appropriate technical service distribution depot for disposition in accordance with TM 38-220.

4.16. Bins, Shelving, and Wall Lockers

The Corps of Engineers is responsible for specifications, requirements, funds, purchase, and inspection of locally constructed bins, shelving, and wall lockers, either attached to a building or detached. Responsibility for specifications, purchase, and inspection of commercially manufactured bins, shelving, and wall lockers is assigned to the Quartermaster Corps. The using service is responsible for determining requirements and furnishing funds. Maximum economy will be enforced in all such installations, consistent with minimum essential requirements of the using service.

a. SHELVES AND CLOTHES RACKS. In barracks without minimum amount of shelves and clothes racks or where double bunking has been authorized, the post engineer will be authorized to build the required shelves and clothes racks from available repairs and utilities funds. Such construction must become permanently installed property con-

stituting part of the real property; it will be installed only if absolutely necessary to proper utilization of the barracks, and will conform as nearly as possible to standards prescribed in the mobilization and theater of operations 700-series drawings. Each request for additional shelving or clothes racks should be carefully examined for conformance with the Directive for Wartime Construction and AR 100-80. All justification should clearly indicate why the requested work is essential to proper utilization of the barracks.

b. BREAD CABINETS. Bread and pastry can be fully protected by door and window screens properly installed and maintained. Therefore, installation of screened bread and pastry cabinets should not be approved.

4.17. Mess Tables and Stools

Standard quartermaster mess tables and stools will no longer be issued to equip new messes. The post engineer will repair quartermaster tables and stools already installed in messes under the same policy governing other furniture repair, provided that replacement parts are available at the post or obtainable from existing stock. Unserviceable tables and stools will be salvaged in accordance with provisions of AR 700-25 when existing stocks of standard quartermaster mess tables and stools and their replacements have been depleted. The post engineer will replace salvaged items with the type mess tables and benches now provided cantonment type mess halls. Cantonment type mess tables will not be dressed up after initial construction by adding metal or composition edges, linoleum tops, or similar refinements.

4.18. Bedsteads and Cots

Maintenance of cots and beds has been interpreted as falling within the scope of general maintenance, and therefore will be performed in the combined shop, if available, or by the post engineer. The local post commander will determine which facilities are more suitable for the work.

TM 38-220 provides for establishing a 15-day model stock of standard repair parts for cots and beds at the shop performing the maintenance, in addition to normal stock authorized for the station. This model stock will be replenished as necessary from regular stocks. Standard requisi-

tionable parts, therefore, will be secured from the post quartermaster; labor and materials purchased or parts fabricated locally will be an expense of the local shop. Where maintenance and repair are to be performed by the post engineer, he should advise the quartermaster supply officer of the initial model-stock requirements and anticipated changes in demand.

4.19. Nonstandard Furniture

Nonstandard furniture will be repaired by the post engineer in accordance with policies for repairing standard items. If the post engineer believes these articles are basically too fragile or for any other reason unsuitable for the immediate intended use, he will not repair them even though the repair could be made economically.

Section III. PACKING AND CRATING

4.20. General

All packing and crating at class I and II installations is a repairs and utilities responsibility. This includes ordnance shop packing and crating. Employees whose time or major portion thereof is utilized in packing and crating at class I and II installations are properly chargeable to repairs and utilities funds. Repairs and utilities funds will be used without reimbursement at class I and II installations to purchase necessary lumber, supplies, and materials. Twine, wire strappings, nails, box-strapping seals, wrapping paper, and other supplies stocked by QMC will be provided by QMC depots from stock without reimbursement or QMC depots will make funds available therefor. Packing and crating may be done by contract where necessary. The above procedures apply at class IV installations, except manufac-

turing plants, proving grounds, depots, arsenals, and ports of embarkation. All packing and crating activities, including household effects, will be the responsibility of the respective technical services at such excepted class IV installations and funds will be provided through technical service channels. Packing and crating activities, including household effects, at class III installations are not considered to be a repairs and utilities function, but will be performed and paid for from funds as directed by the Commanding General, AAF.

4.21. Baggage-car Conversions

Cost of baggage-car conversion accomplished by the post engineer for transporting troops or prisoners of war is chargeable to the same funds as packing and crating. (See par. 4.20.)

Section IV. CUSTODIAL SERVICES

4.22. General

a. **DEFINITION.** Custodial services include furnishing and supervising personnel for the following activities at class I and II installations as a part of the repairs and utilities responsibilities of the commanding generals of service commands:

(1) Maid service for operation of civilian dormitories.

(2) Janitors.

(3) Elevator operators.

(4) Window cleaners.

Note. This definition is not related to that for Crafts, Protective, and Custodial Service as given in the Classification Act of 1923, as amended.

b. **AT CLASS I AND II INSTALLATIONS.** Post engineers will not provide civilian custodial personnel at the following facilities except in very unusual circumstances, as determined by the commanding general of the service command or his delegated representative.

(1) Military organizational buildings such as barracks, quarters, day rooms, organizational and company store rooms, mess halls, bath houses, latrines, and guard houses.

(2) Buildings such as fire stations where personnel are present and available for custodial work. Custodial services at such facilities will remain the responsibility of the assigned field force unit or of station complement personnel to which the building is assigned. Existing operating personnel will be used at facilities such as hospitals, warehouses, and garages before additional custodians are authorized. Custodial services in all officers' and noncommissioned officers' quarters and in profit-making organizations such as officers' clubs and post exchanges will be paid for from funds provided by the occupants or users.

c. **AT CLASS III AND IV INSTALLATIONS.** The Commanding General, AAF, and the chiefs of the technical service concerned are responsible for providing civilian custodians at class III and IV installations under their control as a part of their technical service responsibility, utilizing appropriate available service funds. Custodial services at class IV installations under chiefs of staff or administrative services will be furnished as a repairs

and utilities responsibility in same manner as class I and II installations.

d. **AT AAF FACTORY TRAINING SCHOOLS.** At AAF factory training schools under AAF technical training command jurisdiction, firing of individual heaters and removing ashes will be provided either in kind by repairs and utilities personnel or by contract between the AAF and the airplane manufacturer concerned.

4.23. Janitorial Supplies

Janitorial supplies are items such as soap, wiping cloths, scrubbing brushes, and disinfectants, which are indispensable to the cleanliness of buildings and equipment. The Quartermaster Corps will furnish janitorial supplies to posts, camps, and stations on the basis of allowances authorized in T/A 20 and 20-1, and to class I, II, and III installations, on the basis of OQMG allowances. At class IV installations, these supplies will be furnished by the using service. The post engineer will not furnish janitorial supplies to any using agency from repairs and utilities funds.

4.24. Floor Wax and Polishing Machines

a. **SUPPLY OF FLOOR WAX.** Furnishing wax for floor preservative purposes is a repairs and utilities function. High gloss on floors is not required by The Surgeon General from a health point of view and it constitutes a definite accident hazard. Use of floor wax of a water-emulsion type (self-polishing) eliminates this hazard and provides a lustrous finish without machine polishing. Service command engineers will provide for central procurement of water-emulsion wax for use at all War Department installations located within their territorial boundaries. This wax should conform to Federal Specifications P-W-151a, Wax, Floor, Water-emulsion, and will be used at all War Department installations so far as possible to the exclusion of other types of floor wax except that obtainable from excess or surplus stocks.

b. **APPLICATION OF FLOOR WAX.** The application of floor wax is a repairs and utilities responsibility at class I and II installations and is a

responsibility of the using service at class III and IV installations. (See par. 4.22.)

c. FLOOR POLISHING EQUIPMENT. Equipment such as polishers, brushes, and applicators are engineer property and will be carried on the post engineer's records as such. They may be issued

to the using organization at class III and IV installations on memorandum receipt. Every effort must be made to keep the available floor polishing machines in a good state of repair. Local procurement of floor polishing machines is not permitted.

Section V. MESS AND INSTALLED EQUIPMENT

4.25. Installed Equipment

Requests for equipment which requires installation should be submitted as project requests on WD AGO Form 5-25 when the estimated cost of equipment and installation exceeds \$1,000. This will eliminate the possibility of equipment being shipped on requisition and then having its installation disapproved.

4.26. Mess Equipment

a. DEFINITION. Mess equipment as used herein includes the following power-operated, installed, or immovable equipment, mess:

(1) Equipment, mess, including kitchen, meat cutting, rendering, and pastry baking.

(2) Army ranges.

(3) Refrigerators and refrigeration equipment listed as follows:

(a) Household type (up to 18 cu. ft.)—for new facilities; ice cube makers (up to 48 pounds per freeze); and ice chests (up to 400 pounds).

(b) Prefabricated—reach-in/walk-in type; walk-in type; and frozen food type.

(c) Commercial type (over 18 cu. ft.).

(d) Power-operated ice cream freezers (20-40 gal.).

b. ASSIGNMENT OF RESPONSIBILITY. The following assignment of responsibilities is stated:

(1) *Quartermaster Corps.* (a) Specifications.

(b) Purchase and inspection, except authorized local procurement of repair parts.

(c) Storage and issue including control of stock.

(d) Property accounting.

(2) Repairs and utilities.

(a) Requirements and funds.

(b) Authorized local procurement of repair parts.

(c) Installation and removal.

(d) Maintenance and repair.

(e) Formulation and publication of Army-wide standards, policies, and procedures relating to installation, removal, maintenance, and repair.

c. AUTHORITY FOR INSTALLATION AND REMOVAL. Determination of authority for installa-

tion of equipment, mess, will be based on the provisions of AR 100-80 and paragraph 1.63.

(1) Installations involving a cost, including the value of the equipment, of \$1,000 or less may be approved by the post commander only when in accordance with the Tables of Allowance established in TM 5-603 (when published).

(2) Requests for approval for installations where the cost, including the value of the equipment, is estimated to exceed \$1,000 will be processed on an Individual Project Estimate (WD AGO Form 5-25).

(3) Requisitions for equipment required in excess of the allowance established in TM 5-603 will include detailed justification and sketch of proposed lay-out.

(4) Prior approval for the use of the fuels must be obtained from the Chief of Engineers through appropriate channels and this approval noted on the requisition for:

(a) New installations proposing to use gas (including liquefied petroleum gas), oil, or electricity.

(b) Replacements or additions which will result in an increased use of fuels referred to in (a) above.

(5) When the conversion of a building in which equipment, mess, is installed has been approved by competent authority, the post engineer will remove the equipment and, unless an authorized local requirement exists, will return it to the station supply officer, who will report it to the appropriate quartermaster depot for disposition instructions. The condition of the equipment will be adequately described in the report to the appropriate depot.

d. SUPPLY PROCEDURE. Allowances for mess equipment will be based on tables contained in TM 5-603. Requisitions for mess equipment at posts, camps, and stations in continental United States will be forwarded as outlined below and *not* direct to the supplying depots:

(1) Requisitions from class I, II, and IV installations will be forwarded by the station supply officer to the commanding general of the service command, Attn: service command quar-

termaster, for editing, technical review (including coordination with service command engineer on structural and fuel requirements), and approval.

(2) Requisitions from class III installations will be forwarded in accordance with the instructions of the Commanding General, AAF.

(3) Requisitions approved under (1) and (2) above will be forwarded to The Quartermaster General, Attn: Storage and Distribution Division, General Supplies Branch.

(4) Where approval for installation or use of fuel must be obtained, as set forth in c(2), (3), and (4) above, the requisition will be submitted as an inclosure to the Individual Project Estimate (WD AGO Form 5-25), or request for approval of use of fuel, through established channels.

(5) Upon approval of projects or requests submitted in accordance with (4) above, the approving authority will withdraw the requisition from the correspondence and forward it as stated in (3) above.

e. MAINTENANCE, REPAIR, AND REPLACEMENT. Maintenance and repair of equipment, mess, will be accomplished from repairs and utilities funds, available locally in accordance with policies prescribed in TM 5-637 and 5-641 (when published). The determination as to whether equipment will be repaired and continued in service or replaced will be made by the post engineer. Approval of the service command engineer will be obtained prior to the declaration of such equipment as unreparable.

f. SUPPLY PROCEDURE FOR REPAIR PARTS. Requisitions for repair parts for ranges, Army Nos. 3, 3A, and 5, originating at posts, camps, and stations will be forwarded direct to appropriate quartermaster key depots for supply without reference to OQMG. Repair parts, other than those for range, Army, Nos. 3, 3A, and 5, required by posts, camps, and stations within the continental United States will continue to be procured from repairs and utilities funds available locally, except repair parts, indicated as centrally procured by OQMG (with concurrence of the Chief of Engineers) or available from service command repairs and utilities warehouses or excess lists, will not be procured locally. Centrally procured items will be requisitioned direct from appropriate quartermaster key depots without reference to OQMG. Items available from serv-

ice command repairs and utilities warehouses or excess lists will be requisitioned from the service command engineer.

g. ACCOUNTABILITY. Accountability for equipment, mess, and repair parts for Army ranges Nos. 3, 3A, and 5 at posts, camps, and stations within the continental United States will be taken up on the quartermaster section of the stock record account. Installed equipment, mess, will be recorded on the quartermaster section of the installed property records. Accountability for repair parts, other than those procured through quartermaster channels, will be taken up on the repairs and utilities stock record account until issued for use. Such issues will be made on the authority of Repairs and Utilities Work Order (WD AGO Form 5-35).

h. COSTS. The cost (or value) of all items of equipment, mess, and repair parts obtained through quartermaster channels will be furnished the post engineer by the station supply officer as the items are issued. The cost (or value) of all equipment or repairs thereto will be entered in the repairs and utilities cost accounts.

i. EQUIPMENT FOR MESSES OPERATED UNDER AR 210-60. Equipment furnished to messes and necessary for operation of the mess halls within the authorized strength of personnel will be provided upon requisition through central procurement from repairs and utilities funds. The same procedure will be followed for replacement of equipment destroyed by fire, storm, etc., due to normal wear and tear, or in event the authorized strength is increased above the designed capacity of the mess hall. Equipment desired for serving personnel other than that authorized or extra equipment for convenience cannot be provided from repairs and utilities funds, but may be secured locally from the funds of the organization operating the mess hall, restaurant, etc.

4.27. Butcher Blocks

Butcher blocks, 30 x 30 x 16 inches, will be issued by the Quartermaster Corps in accordance with T/A 20.

4.28. Dishwashing Facilities in Diet Serving Kitchens of General Hospitals

To provide proper facilities for washing and sterilization of dishes, the installation of spray rinse

cabinets, hot water boosters, sinks, exhaust fans, and counters in diet serving kitchens of all general hospitals is authorized. Drawings KE 605-119 and 1100-2500A (available from service command engineers) show the approved arrangement of the equipment. Requisitions should be submitted through quartermaster channels for spray rinse cabinets and sinks, and to service command engineers for exhaust fans, where required. The remaining items should be either constructed or procured locally.

4.29. Installing Bakery Ovens

To reduce the fire hazard incident with faulty installation, oven mountings in central pastry bakeries will be constructed in accordance with standards established in the Building Code of the National Board of Fire Underwriters (available from National Board of Fire Underwriters). In addition, when ovens are installed over existing framed floors, the supporting structure should be

properly reinforced. Corrective action, when necessary, will be initiated immediately to correct existing installations in accordance with this policy.

4.30. Installation of Technical Equipment

The post engineer is responsible for the furnishing of appropriate electrical outlets, conduits, and plumbing, and for effecting alterations in construction as may be required in connection with the installation of technical items of equipment. Installations of technical equipment may also be performed by the post engineer, when directed by the post commander, without reimbursement even though it is necessary to employ additional personnel or to execute a contract for the accomplishment of the work. See paragraph 1.65 for a determination as to the amount of the repairs and utilities project for the accomplishment of such work.

Section VI. OUTSIDE MAINTENANCE TOOLS AND EQUIPMENT

4.31. Repairs and Utilities Equipment

a. LIMITATIONS ON PURCHASE. For limitations on purchasing repairs and utilities equipment, see paragraph 1.37.

b. PREVENTIVE MAINTENANCE. Policies governing maintenance of repairs and utilities outside construction and maintenance equipment are outlined in TM 5-625 (when published). Service command engineers will conduct technical inspections to ascertain whether a complete program of preventive maintenance of outside construction and maintenance equipment is being conducted. The maintenance program will include:

- (1) First-echelon maintenance:
 - (a) Performed by and the responsibility of the equipment operator.
 - (b) Performed daily.
 - (c) All pertinent services listed on rear of WD Form 48, and any additional services peculiar to an individual unit.
- (2) Second-echelon maintenance:
 - (a) Performed by post engineer mechanic assisted by regular equipment operator.
 - (b) Performed at 64-hour (weekly) or 256-hour (monthly) periods as specified in Technical Manuals, Technical Bulletins, Lubrication Orders, or manufacturers' manuals.

c. EQUIPMENT IN STORAGE. Preventive maintenance services required in preparing equipment for storage and returning equipment from storage to active use will be stressed. The provisions of AR 850-15, TM 5-9715, and TM 31-200 will be followed by post engineers in providing these services. Service command engineers will inspect the condition of equipment in storage to assure that post engineer personnel are properly instructed with respect to:

- (1) Care of pneumatic tires on stored equipment.
- (2) Inspection and servicing during storage.
- (3) Correction of faulty storage.
- (4) Proper servicing and lubrication of equipment being returned to service from storage.

4.32. Used Machinery, Tools, and Equipment

Used maintenance machinery, tools, and equip-

ment other than controlled items may be purchased locally by post engineers if the items cannot be gotten by transfer from excess lists and if the approving authorities stated in AR 100-80 are followed. Secondhand tools and equipment must be checked before purchase to insure that they are serviceable and satisfactory for their intended use.

4.33. Renting Equipment

Funds will not be adjusted when equipment owned by any military project or activity is rented to another military project or activity. Cost of repairs to such equipment will be met from funds available to the project or activity which repairs the equipment. Rental for equipment owned by any military project or activity which is rented to projects financed with nonmilitary funds and for equipment owned by projects or activities not financed with military funds which is rented to military projects or activities will be paid through an adjustment of funds on Standard Form 1080.

4.34. Repairing Post Engineer Equipment

Engineer equipment assigned to post engineers will be repaired on the post if facilities are available. If the necessary facilities are not available on the post, the division engineer will be responsible for providing repair facilities; ESA project 450 funds available to the division engineer can be used for this purpose. No reimbursement will be made. Post engineer equipment which has been turned over to division engineers for repair only will be returned to the post engineer when repairs are completed.

4.35. Athletic or Recreational Facilities

Although appropriated funds are not available for developing athletic facilities, maintenance equipment available to the post engineer can be used for this purpose if it will not interfere with performance of repairs and utilities responsibilities. Post engineers will follow provisions of appropriate War Department authority when fur-

nishing materials, supplies, equipment, or services to provide or improve recreational buildings or facilities. The post engineer will not *extend* his priority ratings to procure any items for such projects; no equipment which requires a priority for replacement will be withdrawn from post engineer stocks unless it is subsequently replaced. (See par. 1.20.)

4.36. Manufacturing Plants

The operating service will be responsible for operation of mobile maintenance equipment and special-purpose vehicles in industrial or proof sections of Government-owned and operated Chemical Warfare Plants and Ordnance Department proving grounds. Operating such equipment is a repairs and utilities responsibility when used for maintaining all other features of general usage. For a list of facilities to which this policy applies, see paragraph 1.9.

4.37. Issue to Troops and Prisoners of War

For information on issuing tools and supplies to troops and prisoners of war, see paragraph 1.58.

4.38. Motor Vehicles

a. RESPONSIBILITIES. Responsibilities for procurement, maintenance, storage and issue of maintenance parts for automotive equipment is covered in WD Circular 240, 1944.

(1) *Ordnance Department.* The Ordnance Department is responsible for designing, developing, and procuring general-purpose wheeled vehicles and chassis of special-equipment wheeled vehicles.

(2) *Other technical services.* The using technical service is responsible for designing, developing, and procuring special-purpose wheeled vehicles and special bodies or equipment. Before beginning development of special-purpose wheeled vehicles, a using technical service will consult with the Ordnance Department and will make every effort to use a general-purpose vehicle. Special-purpose vehicles will use standard parts and assemblies unless it is clearly shown that these will not be satisfactory. Using arms or services will collaborate in designing and developing all vehicles. For more detailed information, see AR 850-25.

b. MODIFICATIONS. General-purpose vehicles which have been modified only slightly to meet

repairs and utilities requirements may continue to be considered general-purpose vehicles. If modifications are so extensive that the vehicles are permanently unfit for general purposes, they are no longer considered in that classification.

c. REPAIRS. Standard ordnance vehicles which can be repaired cheaply will be repaired by service command facilities using parts supplied by ordnance. On request, repairs which can be made cheaply on Corps of Engineers nonstandard vehicles may be performed by ordnance, using parts supplied by the Corps of Engineers. Where there are no engineer repair facilities and ordnance facilities are used to repair nonstandard engineer vehicles, parts will be procured in the same way as for repairs made in an engineer repair facility.

Note. Repairs and utilities funds will not be used for expenses incidental to maintenance and operation of vehicles drawn from the post motor pool.

d. DISPOSITION. (1) *Ordnance vehicles.* To simplify maintenance and to make available to civilians serviceable or easily repairable motor vehicles, 1939 and earlier models of ordnance-issued engineer vehicles will be removed from service.

Note. This does not apply to special-service equipment under jurisdiction of post engineers for repairs and utilities activities.

(2) *Engineer vehicles.* Ordnance will prepare a report of survey on surplus Corps of Engineer vehicles which are turned in to service command pools. When engineer vehicles which are brought to service command shops for repair cannot be repaired economically, the Corps of Engineers will be notified and will prepare a report of survey on the vehicle.

e. PERSONNEL TRANSPORTATION. Basic War Department policy on using Government-owned vehicles to transport military or civilian War Department personnel, employees of contractors with the War Department, or others between their domiciles and places of employment is stated in AR 850-15. Transportation will not be authorized in the following:

(1) Government-owned motor vehicles with a seating capacity of less than 12 passengers.

(2) Government-owned motor vehicles with a seating capacity of 12 or more passengers without approval of the commanding general of the service command, air force, or AAF command concerned.

f. ADMINISTRATIVE USE. Administrative vehicles will be assigned post engineers in accordance with current War Department policy governing the supply of vehicles for administrative use.

g. WEAPONS CARRIERS. The Office, Chief of Ordnance has assigned ½-ton 4 x 4 weapons carriers to each service command for reassignment to individual post motor pools under control of post commanders. These vehicles will be made available to post engineers, when needed, for use in towing high-speed gang mowers at airfields now supplied with this equipment. This use will have priority over other uses; when not needed for this specific purpose, the vehicles will be available for other dispatch.

Note. Hitches and stabilizers designed for attaching Worthington high-speed mowers to ½-ton weapons carrier have been procured by OCE and distributed to each service command for redistribution to posts. Stabilizers are needed for satisfactory high-speed mower operation to eliminate side sway.

4.39. Motor Pools

General-purpose administrative vehicles required for repairs and utilities work will be issued to the post, camp, or station motor pool and will be furnished to the post engineer, when required on dispatch or as the post commander may direct. This policy permits the post commander to authorize the post engineer to operate a separate submotor pool of general-purpose administrative vehicles in conjunction with the post engineer's submotor pool of special-purpose and special-equipment vehicles. This procedure is deemed appropriate in most instances. However, the provisions of AR 850-15, relating to the pooling of vehicles, will be applied to the greatest practicable extent.

4.40. Railroad Maintenance Equipment

The provisions of AR 55-650 on procurement, operation, and maintenance of railroad equipment are interpreted to mean that the Transportation Corps will estimate for, procure, purchase, store, and issue all locomotives, general rolling stock, and mechanical equipment designed primarily for operation on railroad tracks and required for maintenance-of-way purposes, including motor cars, handcars, self-propelled snow plows, mowers,

plows, and other accessories for attachment to locomotives or railroad rolling stock. This equipment will normally be operated and maintained by the Transportation Corps; when needed it will be made available to the Corps of Engineers for maintenance-of-way work for which that service is responsible. Work equipment such as handcars and motor cars may be subassigned to post engineers where expedient or where justified by the volume of maintenance activity at a post.

4.41. Farm Machinery and Equipment

a. LIMITATIONS ON PURCHASE. New farm machinery, equipment, and attachments will be purchased only when—

(1) Authorized in Tables of Allowances, Tables of Organization and Equipment, or special lists prepared by the Commanding Generals, AGF, AAF, or ASF.

(2) Approved War Department requirements have been established on an operational (class IV) basis.

(3) Required for imperative needs not provided for in (1) and (2) above; in such cases, approval of the Director, Purchases Division, Headquarters, ASF, will be obtained through channels. Requests for purchases will be accompanied by a complete statement of facts establishing the essentiality of the proposed purchase.

b. PURCHASES. Normally, all purchases authorized above will be made direct from the manufacturer. Purchases may be made from other sources only when approved through channels by the Director, Purchases Division, ASF. Requests for approval will give the reason for the need to purchase from a source other than the manufacturer; it will also include the make and model of equipment, name and address of contemplated vendor, and name and address of manufacturer or distributor from whom vendor intends to obtain stock replacement of requested items.

4.42. Spare Parts Supply for Snow-removal Equipment

Spare parts will be procured locally for snow-removal equipment used at posts, camps, and stations; however, existing stocks available in division engineer warehouses must first be exhausted.

4.43. Fuels and Lubricants

Procurement of fuel and lubricants for use in post engineer equipment is limited to items meeting current Army, Navy, Joint Army-Navy, Federal, or tentative technical service specifications; other items can be procured only when specific authorization is secured from The Quartermaster General, Fuels and Lubricants Division. If prescribed petroleum products are not available or if the available supply is believed not to conform to specifications, a report will be forwarded through supply channels to the chief of the technical service responsible for supplying the product involved. Complaints on the use or effect of prescribed petroleum fuels and lubricants will be processed in duplicate through technical channels to the chief of the technical service responsible for the equipment concerned. War Department Lubrication Orders contain approved first- and second-echelon lubrication instructions for mechanical equipment; Lubrication Orders now available will be carried with or attached to the equipment to which they apply. Instructions contained in them are *mandatory*.

4.44. Tires and Tubes

a. REPLACEMENT TIRES AND TUBES. The term *replacement tires and tubes* includes replacement new, serviceable used, and reconditioned solid and pneumatic tires and tubes and their component parts and repair materials used on wheeled vehicles and combined wheeled and track-laying vehicles operated by all arms, technical services, and the AAF; tires and tubes for materials-handling equipment are included, but those for aircraft are not.

(1) *Responsibility.* The Ordnance Department is responsible for design, development, testing, specification, determination of requirements, provision of funds, purchase, inspection, storage, issue, and inventory control of replacement tires and tubes.

(2) *Replacement.* In emergency, replacement items may be purchased by use of OPA Form R-12. However, no more than two tires and/or tubes will be purchased for one vehicle without written approval of the chief of the technical service responsible for issue.

(3) *Maintenance.* For information on maintenance

and care of pneumatic tires, see TM 31-200.

b. SECOND TIRES AND TUBES. A certain percentage of new tires and tubes produced for the Army are rejected by factory and ordnance inspectors. In view of the critical tire shortage, these substandard tires and tubes will be purchased by the Ordnance Department and branded with the word **SECOND**. They will be purchased only if the factory and ordnance inspectors both estimate they will give at least 75 percent of normal new-tire service.

(1) *Issue.* Second tires and tubes will be issued under Ordnance Department regulations on an exchange basis for unserviceable tires or tubes through tire-collection centers established in each service command.

(2) *Removal from service.* Second tires or tubes removed from service for exchange will be inspected by tire-collection centers under Ordnance Department regulations.

4.45. Antifreeze Solutions

The Bureau of Standards recommends strongly against the use of salt solutions as antifreeze agents for Government vehicles because of their highly corrosive action on cooling systems. The penetrating quality of calcium chloride solution is not materially different than that of water.

Note. Any antifreeze solution finding its way into the crankcase or motor may seriously damage the bearings and moving parts.

4.46. Heaters and Defrosters

One standardized motor-vehicle cold-weather kit will be issued for each truck operating north of 45° North Latitude, except in sections of Oregon and Washington west of the Cascade Mountains. In areas where climatic conditions justify a departure from this policy, heaters which can be procured locally from funds available to local commanders can be installed in closed-cab vehicles used to operate snow plows.

4.47. Garden Hose

The Corps of Engineers is responsible for procuring water hose and adjustable ¾-inch hose nozzles. Since these items are not centrally purchased or issued by OCE, OCE will direct re-

quests for supply pertaining to post functions to the respective service command headquarters for necessary action. Purchase, storage, and issue of these items for post functions may be handled centrally through service command headquarters or locally by post engineers, whichever is more expedient. Repairs and utilities funds can be used for such purchases.

4.48. Mules

The Quartermaster Corps is responsible for furnishing and maintaining all mules used for military and garrison purposes. (See AR 30-405 and 30-500.) Post engineers will not purchase mules; they will requisition their needs from post quartermasters.

CHAPTER 5

UTILITIES

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. Air conditioning and ventilation	5.1-5.2	98
II. Electric services	5.3-5.17	103
III. Fuel	5.18-5.42	108
IV. Heating	5.43-5.67	118
V. Refrigeration	5.68-5.73	126
VI. Water and sewage	5.74-5.91	129
VII. Utilities contracts	5.92-5.104	134
VIII. Permanently installed petroleum products storage and distribution systems	5.105-5.115	136

CHAPTER 5

UTILITIES

Section I. AIR CONDITIONING AND VENTILATION

5.1. Installation Policy in Continental United States

a. JUSTIFICATION. Air conditioning, cooling, or ventilation equipment will not be installed to increase efficiency of personnel or provide physical comfort. All installations must be justified by local conditions of temperature or humidity, health of personnel, functional requirements, and proper utilization of space. The system selected will be the simplest that will provide the required service. Evaporative coolers will be used only where climatic conditions make their use practicable. Duct work and equipment sizes will be kept to a

minimum. Duct work will be nonmetallic wherever possible.

b. USE OF EXISTING INVENTORIES. Existing public and private inventories will be exhausted by using services before orders are placed which will result directly in new manufacturer or fabrication.

c. INSTALLATIONS PERMITTED. Table I shows types of equipment allowed for specific uses in specific regions. Where air conditioning or evaporative cooling is permitted, mechanical ventilation will be substituted when satisfactory operating conditions can be attained.

Table I. Authorized uses for air conditioning and ventilation equipment.

SYMBOLS

AC—Air conditioning.

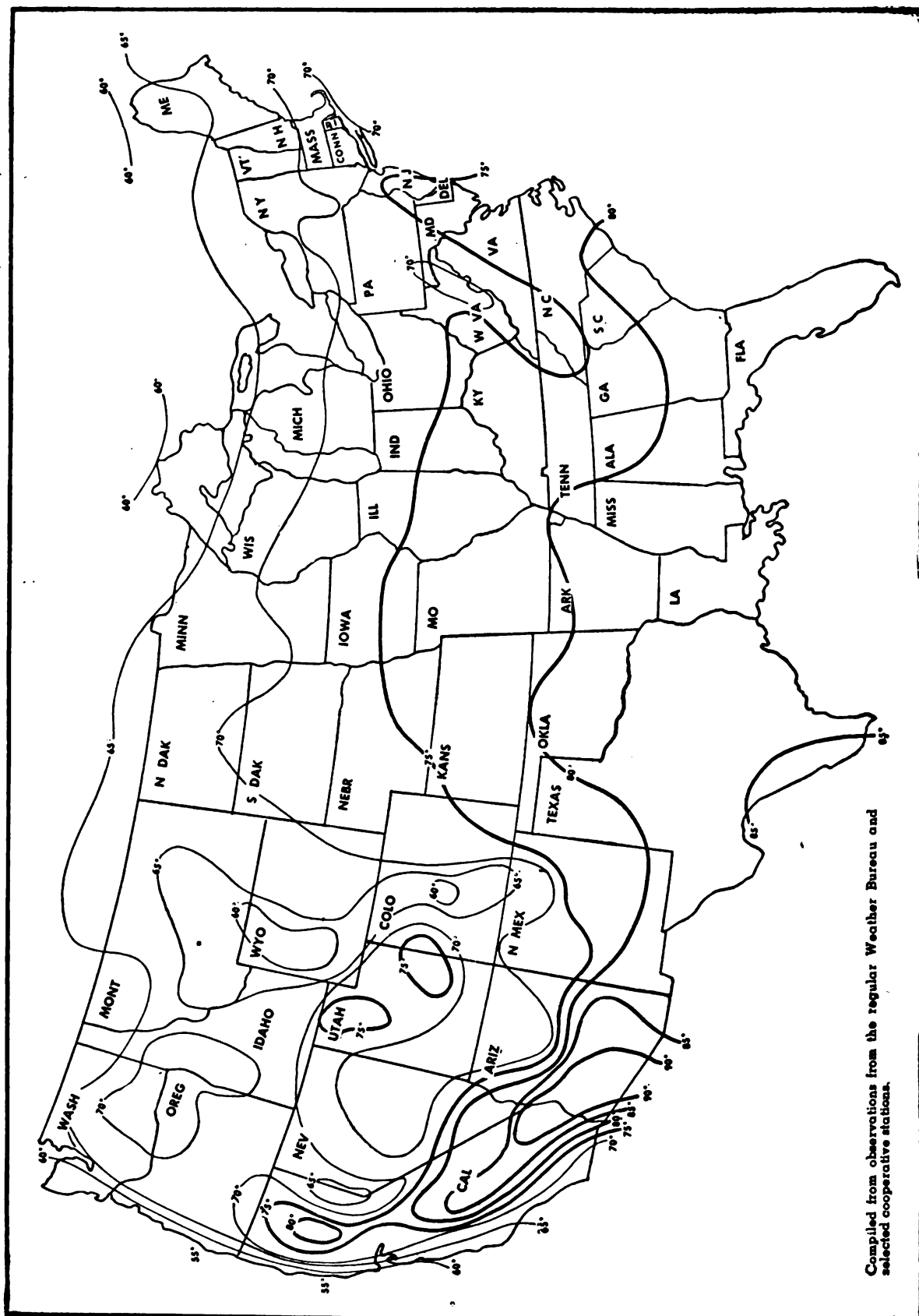
EC—Evaporative cooling.

MV—Mechanical ventilation.

X—No mechanical installation of any type allowed.

R—Regional hospitals only.

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU—Normal July Temperature (Fahrenheit)



Compiled from observations from the regular Weather Bureau and selected cooperative stations.

Figure 1.

Table I. *Authorized uses for air conditioning and ventilation equipment—Continued.*

Use	Regions as defined by isotherms on Weather Bureau map of normal July temperatures (fig. 1).			
	SW desert areas where temperature is 80° or more.	Areas where temperature is 80° or more (except SW desert area).	Between 80° and 75° isotherms.	Areas where temperature is less than 75°.
1	2	3	4	5
To control temperature and/or humidity essential for product processing.	AC	AC	AC	AC
To insure uniform charges for proof testing in gun and armor-plate plants.	AC	AC	AC	AC
To insure accuracy of fine machine work and in manufacturing, inspecting, adjusting, repairing, and storing precision instruments and optical elements.	AC	AC	AC	AC
To control atmosphere on conditions in celestial-navigation trainer and link-trainer spaces, jam-handly and instrument-trainer buildings, low-pressure chambers, and spaces housing synthetic training devices.	AC	AC	AC	AC
Main air-traffic control towers.....	EC	AC	AC	AC
Any of the 23 installations defined by AAF as flight control centers.	EC	AC	AC	MV
Underground fortifications in plotting and switchboard rooms, mine casements, command posts, and seacoast battery service magazines.	AC	AC	AC	AC
Spaces required for processing and storing materials, for loading and unloading gun-camera film, and for storing gun-camera film and gun cameras in photographic laboratories and reproduction plants.	AC	AC	AC	AC
Evaluating or assessing rooms for reviewing gun camera films.	EC	MV	X	X
Medical facilities:				
Hospitals:				
General hospitals:				
Surgeries	AC	AC	AC	AC
X-ray rooms and dark rooms	AC	AC	AC	MV
Recovery rooms	AC	AC	AC	AC
Dental clinics (including dental laboratories)	EC	AC	AC ¹	X
EEN&T clinics	EC	AC	AC	X
Clinics other than dental or EEN&T clinics (including infirmaries and receiving clinics).	EC	MV	MV ¹	X
Wards	EC	MV	MV ¹	X
Patient's mess halls	EC	MV	MV ¹	X
Duty personnel mess halls	EC	MV	MV ¹	X
Patient's recreation rooms	EC	MV	MV ¹	X
Post exchanges	EC	MV	MV ¹	X
Libraries	EC	MV	MV ¹	X
Administration buildings	EC	MV	MV ¹	X
Barracks and quarters	EC	MV	MV ¹	X
Regional hospitals:				
Surgeries	AC	AC	AC	AC
Recovery rooms	AC	AC	AC	AC
X-ray rooms and dark rooms	AC	AC	AC	MV
Dental clinics (including dental laboratories)	EC	AC	AC	X
EEN&T clinics	EC	AC	AC	X

Table I. *Authorized uses for air conditioning and ventilation equipment*—Continued.

Use 1	Regions as defined by isotherms on Weather Bureau map of normal July temperatures (fig. 1).			
	SW desert areas where temperature is 80° or more. 2	Areas where temperature is 80° or more (except SW desert area). 3	Between 80° and 75° isotherms. 4	Areas where temperature is less than 75°. 5
Clinics other than dental or EEN&T clinics (including infirmaries and receiving clinics).	EC	MV	MV ¹	X
Flight surgeons clinics	EC	AC	AC ²	MV
Wards	EC	MV	MV ¹	X
Patients' mess halls	EC	MV	MV ¹	X
Patients' recreation rooms	EC	MV	MV ¹	X
Sleeping quarters for personnel whose duties require regular or intermittent periods of night work to the extent of one officers' quarters building, one nurses' quarters building, and one barracks building, or 10 percent of hospital personnel, at each hospital, whichever is greater.	EC	MV	MV ¹	X
Station hospitals:				
Surgeries	AC	AC	AC	X
X-ray rooms and dark rooms	AC	AC	AC	MV
Recovery rooms	AC	AC	AC	X
Dental clinics (including dental laboratories)	EC	AC	MV ¹	X
EEN&T clinics	EC	MV	MV ¹	X
Clinics other than dental or EEN&T clinics (including infirmaries and receiving clinics).	EC	MV	MV ¹	X
Flight surgeons' clinics	EC	AC	AC ²	MV
Wards	EC	MV	MV ¹	X
Patients' mess halls	EC	MV	MV ¹	X
Patients' recreation rooms	EC	MV	MV ¹	X
Sleeping quarters for personnel whose duties require regular or intermittent periods of night work to the extent of one officers' quarters building, one nurses' quarters building, and one barracks building, or 10 percent of hospital personnel, at each hospital, whichever is greater.	EC	MV	MV ¹	X
Other Medical Facilities:				
Flight surgeons' clinics	EC	AC	AC ²	MV
Dental clinics (including dental laboratories)	EC	AC	MV ¹	X
Central dental laboratories	EC	AC	MV ¹	X
Service command laboratories and special laboratories..	EC	AC	MV ¹	X
Dispensaries and infirmaries for minor operations.....	EC	MV	MV ¹	X
Sleeping quarters for nonhospital personnel whose duties require 1 week or more of night work at least once a month.	EC	X	X	X
Permanently blacked-out buildings without windows or with permanent closures which cannot be opened or removed for ventilation purposes.	EC	MV	X	X
Special-process spaces requiring more ventilation than gravity methods provide, because of nature of materials processed or production of dust, fumes, gases, or vapors injurious to health.	MV	MV	MV	MV
Dish-washing spaces	MV	MV	MV	MV

¹ Evaporative coolers may be installed where humidity makes their use practicable.² Evaporative coolers will be installed where humidity makes their use practicable.

d. EXCEPTIONS. Exceptions will be made only when justified by reports containing the following information:

(1) Character, size, and use of space, and number of occupants.

(2) Maximum outdoor temperatures and length of time such temperatures prevail.

(3) For buildings in operation, maximum inside temperatures, seasonal duration of these temperatures, and the time personnel is exposed.

(4) Brief descriptions and sketches of desired installations, including number, location, size, and capacity of proposed equipment, and extent of electrical and duct work involved.

(5) Humidity conditions when applicable.

For repairs and utilities purposes, exceptions to table I will be processed for class I, II, and IV installations through the service command engineer and OCE to War Department. Requests for exceptions for class III installations will be processed through the commanding general of the air force or AAF command and the Commanding General, AAF, to War Department.

5.2. Hospital Ventilation

a. GENERAL. Commanding generals of service commands, air forces, or AAF commands are authorized to approve installation of exhaust fans providing 60 air changes per hour for use in an hospital unit listed in paragraph 5.1c. Sixty air changes per hour are authorized in all general hospitals and in station hospitals which are of semipermanent, masonry type construction, one or two stories high.

b. VENTILATION FANS. Whenever practicable, fans will be purchased from manufacturers' inventories. Fans in service command inventories will be used for replacement and new installation in cantonment or theater of operations type construction station hospitals, industrial buildings, and all other permitted applications. Ventilation fans are limited-issue items of the Corps of Engineers. They may be purchased by the service command engineer or by post engineers on approval of the service command engineer for new installation or replacement.

Section II. ELECTRICAL SERVICES

5.3. Responsibility

Furnishing electrical services is the responsibility of the service or force responsible for repairs and utilities as prescribed in AR 100-80 and WD Circular 388, 1944. The term *electrical services* includes capacity and readiness to provide service as well as actually supplying electrical energy. Post commanders and post engineers are responsible that provisions of AR 100-90 relating to electric services are properly applied and enforced.

5.4. Army Air Forces

a. **AAF SHOPS.** By mutual agreement of the Chief of Engineers and the Commanding General, AAF, maintaining and operating permanently installed technical equipment in AAF shops is a responsibility of using agencies of the AAF. (See AR 100-80.)

b. **FUNDS.** Repairs and utilities funds will be used to pay all electric bills, including those for night lighting at installations other than those excepted in AR 100-80, and to pay power costs incidental to equipment installations at sub-depots.

c. **TECHNICAL AND NIGHT-LIGHTING EQUIPMENT.** Maintenance and repair of airfield lighting facilities, including underground and overhead distribution systems, transformers, regulators, obstacle lights, runway marker lights, floodlights, wind-indicator lights, and controls, will be performed at AAF installations by the post engineer. Funds for maintenance, repair, alterations, and additions to airfield lighting systems will be provided from Air Corps, Army (ACA) project 424 funds for local procurement of miscellaneous material not supplied through central depots of the ATSC. Personnel performing such work on airfield lighting systems will be paid from ACA project 430 funds.

d. **STAND-BY ELECTRIC GENERATORS FOR AIRFIELDS.** Stand-by electric generators will not be provided as an alternate power source for air-drome field lighting. Semiportable night-lighting sets are provided by AAF for emergency runway lighting in case regular power sources fail. Stand-

by electric generators for airfield control towers are provided by the Army Airways Communication System to operate their radio stations in case of preliminary power failure.

5.5. Signal Corps

a. **COMMUNICATION SYSTEMS.** The Signal Corps is responsible for design, procurement, installation, and maintenance of communication facilities and signal apparatus. Such facilities include public-address systems and interoffice and intraoffice voice-communicating systems. The Corps of Engineers is responsible for procurement, installation, and maintenance of buzzer systems, house doorbells, burglar-alarm systems, and nurses' call systems.

b. **JOINT USE OF POLE LINES.** Poles, guys, and anchors required for telephone service only and suitable only for telephone service will be procured, placed, and maintained by the signal officer and will be accounted for as Signal Corps property. However, if the signal officer and post engineer decide that poles, guys, and anchors are needed for joint use, the post engineer will be responsible for procuring, placing, maintaining, and assuming accountability for them.

c. **PROPERTY RECORDS.** Poles, guys, anchors, and conduit will be taken into the appropriate property records in accordance with AR 35-6520. Underground conduit forming part of a fixed communications system or facility will be carried on real property records in accordance with AR 35-6520, but in all cases will be identified as communications conduit and maintained by the signal officer. Installed building conduit is considered to be an integral part of the building. Records of communications circuits will be maintained by the signal officer.

d. **AIRCRAFT WARNING SERVICES.** The chief signal officer will provide the power plant for Signal Corps requirements and for all utilities at Aircraft Warning Service installations if a local source of power is not available.

5.6. Hospitals

Use of new equipment for emergency stand-by service for hospitals is permitted as follows:

a. GENERAL AND STATION HOSPITALS. On approval of the service command engineer, engine-driven electric generator sets may be used to provide stand-by service at large general or station hospitals where experience has shown there are frequent electric power failures. New purchases will not be made until all excess stocks have been utilized. If units are not available from service command stocks, requisitions will be submitted to OCE. Stand-by service may be used to provide minimum lighting requirements in essential areas such as anesthesia, scrub-up, sterilizer, and operating rooms and to operate regular operating lights and medical equipment. Minimum emergency lighting also may be provided throughout hospital buildings and corridors.

b. BOILER ROOMS. One gasoline-engine-driven electric generator of proper size and characteristics to operate the boiler-room lights and electrically-driven auxiliary equipment, such as pumps, fans, stokers, etc., will be provided for only one heating boiler at all hospitals having a capacity of 50 or more beds, if essential auxiliary equipment cannot be driven except by electric motors.

5.7. Manufacturing Plants

The following table shows whether operating services (OS) or repairs and utilities (RU) is responsible for electrical services at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds. For a list of facilities to which this policy applies, see paragraph 1.9.

<i>Operation</i>	<i>Responsibility</i>
Purchase of electricity supply:	
For industrial use.....	OS
For buildings and grounds (by reimbursement):	
Building lighting	RU
Street and grounds lighting...	RU
Heating, cooking, and refrigeration	RU
Domestic and nonindustrial power	RU
Operation of generating plant:	
Steam and internal-combustion power	OS
Hydro power	OS

<i>Operation</i>	<i>Responsibility</i>
Operation and maintenance of sub-stations	OS
Maintenance of distribution system:	
Outside buildings (by reimbursement)	RU
Inside buildings:	
Industrial-use power	OS
Building use—light and domestic use, except in industrial buildings	RU

Note. For discussion or responsibility for installed equipment, see paragraph 4.7.

5.8. Elevators

a. MAINTENANCE CONTRACTS. The interests of the War Department are best served by having full or partial maintenance contracts for all elevators with the manufacturer or a reliable maintenance contractor.

b. FUNDS. Cost of elevator maintenance is chargeable to repairs and utilities funds.

c. MAINTENANCE BY POST ENGINEER. Where maintenance of elevators by the post engineer has been satisfactory, this type of maintenance will be continued.

d. MANUFACTURING PLANTS. The operating service is responsible for operating general passenger and industrial freight elevators at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds. For a list of facilities to which this policy applies, see paragraph 1.9.

5.9. Lamp Bulbs and Tubes

a. RESPONSIBILITY. Providing all incandescent and fluorescent lamp bulbs and tubes required for interior lighting at *all War Department installations* is a repairs and utilities responsibility.

b. PURCHASES. Purchasing and contracting is done by using the Treasury Department's General Schedule of Supplies, Electric Lamps. Repairs and utilities funds may be used.

c. SPECIAL LAMPS. The using service normally furnishes special lamps for technical equipment.

d. REORDERING. To determine the correct size to be issued, unbroken bulbs should be turned in if possible when obtaining replacements.

e. AUTHORIZED LAMP SIZES. (1) *Where indicated.* Authorized lamp sizes are indicated on record drawings in the post engineer's office, and in List Showing the Quantity of Lamps, Electric, by Wattage Required for All Types of Buildings Authorized under the 700- and 800-series Plans for Mobilization-Type Buildings and Under Plans for Theater-of-Operations-Type Buildings, 31 March 1942, prepared by OCE. (This publication is out of print; however, copies should be available in all service command engineer's offices.) If neither of these criteria are available, the allowable watts per square foot may be obtained from the appropriate division engineer, and the lamp sizes calculated from the floor areas.

(2) *Corrective action.* Under the provisions of AR 100-90 charging post commanders with promulgating and enforcing rules and regulations governing the utilization of electric services, post commanders will eliminate unauthorized consumption of electric energy by replacing oversize lamps with authorized sizes, and by the discontinuance of the use of prohibited electrical appliances. Particular attention will be given to lamp sizes in officers' quarters, enlisted men's quarters, and latrines.

5.10. Lighting Limitations

All restrictions on the use of fluorescent lighting equipment have been removed. However, the use of fluorescent lighting equipment will be justified by the necessity for increased illumination and based on good engineering and economic principles.

5.11. Identification Lights

Special ruby identification lights for fire-reporting telephone systems and fire-alarm telegraph systems are not recommended at present. Suitable identification can be provided by one of two methods which are listed below in order of preference:

a. Installing fire-reporting boxes on poles carrying existing street lights, and painting, dipping, or otherwise identifying a suitable portion of the regular street-light bulb or globe.

b. Installing regular street-light fixtures on poles or supports carrying fire-reporting boxes and installing special identifying bulbs in these fixtures. Such lights should be connected directly to street-lighting circuits.

When the latter method is employed on series street-lighting circuits at high potential and lighting fixtures cannot be rendered reasonably inaccessible to inexperienced personnel, lights will be fed through an individual voltage-reducing transformer to reduce the potential hazard.

5.12. Transformers

Additional transformers should not be purchased unless the following conditions are met.

a. All existing transformers on the distribution systems have been checked to determine the feasibility of exchanging existing transformers and/or shifting loads to release transformers. This may eliminate the necessity for purchasing new transformers or may reduce the size of transformers to be purchased.

b. All distribution transformers are operating as nearly as practicable at the allowable temperature limits during the period of maximum demand. In general, transformers sized to approximately 56 percent of a connected intermittent load will not exceed allowable temperature limits. A greater diversity factor may be used where exact knowledge of connected-load characteristics clearly indicates that allowable temperature will not be exceeded.

c. If the load is continuous, the connected load does not exceed the transformers' rated capacity.

d. All surplus lists have been searched and efforts made to obtain the required transformers from surplus stocks of service commands, division engineers, depots, etc. Close liaison must be established with the service command and division engineer offices responsible for redistribution of excess property.

5.13. Excess Transformer Capacity

As a general rule, excess transformer capacity is indicated when the sum of the installed distribution transformer ratings exceeds the annual high maximum demand (at or adjusted to 100 percent occupancy) by a ratio of 2 to 1. This ratio, however, will be subject to some variation due to local conditions such as load factor and ambient temperature. When the ratio exceeds 2 to 1, transformer load studies will be made to determine the locations of underloaded transformers. Post engineers may secure assistance in accomplishing these load studies through the post

coordinator of the Utilities Wartime Aid Program. Removal of excess transformers to reduce the ratio to 2 to 1, will be accomplished when economically feasible. No reduction in transformer capacity below requirements of the post at 100 percent occupancy will be made. If removal of excess transformer capacity cannot be justified because of economic reasons, consideration should be given to their removal when needed to fill requirements at other posts thus obviating the necessity for the purchase of new transformers. Transformer capacity retained as stand-by stock will vary with the size of the post and the availability of replacements from the stock of the serving utility or the service command. Generally, transformers may be expected to fail at the rate of $\frac{1}{2}$ of 1 percent a year. Therefore, posts should not tie up critical materials by holding emergency stocks in excess of reasonable requirements. The service command engineer will maintain a running inventory of stand-by transformers held at various posts within the territorial limits of the service command. This will enable the service command engineer to shift these transformers to meet emergencies and consequently reduce the stand-by requirements of the posts.

5.14. Miscellaneous

a. **ELECTRIC FANS.** For policy on electric fans, see paragraph 4.10.

b. **ELECTRIC ORGANS.** The Chief of Engineers is responsible for installing and moving electric organs and their power units at posts, camps, and stations. The Chief Signal Officer is responsible for inspection, maintenance, and repair of such organs, and for procurement, storage, and issue of spare parts.

5.15. Utility Wartime Aid Program

A program of cooperation arranged between the electrical utility companies and the War Department includes:

a. An engineering study of post electrical facilities to arrange operating procedures, increase efficiency, check loading of circuits and transformers, locate and salvage excess transformers or other equipment, conserve electric energy, and provide maps, one-line diagrams, etc.

b. Determination of critical power requirements in event of emergency.

c. An inventory of available reserve equipment, supplies, tools, and labor the utility company can supply in an emergency.

d. Liaison between the post engineer, serving utility, regional coordinator, and service command coordinator to plans for cooperation in an emergency.

e. Appointment of an electrical engineer from the serving utility to act as consultant to the post engineer.

Every assistance will be extended to the national coordinator, the regional coordinator, and representatives of the serving companies.

5.16. Requisitions for Electrical Equipment

Each requisition for electrical equipment will be accompanied by a statement as to the adequacy of present wiring, transformers and substation to handle the proposed increase in load and a statement of estimated cost of the entire installation including necessary alterations and additions as well as the cost or value of the equipment being requisitioned. If the total estimated cost exceeds \$1,000, the requisition must be accompanied by WD AGO Form 5-25, and processed through proper channels for approval.

5.17. Sale of Electric Services

a. **INDIVIDUALS.** In accordance with AR 100-90, electricity, when available, may be sold upon the written authority of the commanding officer to those listed in AR 30-2290 as being entitled to purchase services. Such sales will be made in accordance with rates established by the post engineer in accordance with *c* below.

b. **VENDING OR AMUSEMENT MACHINES.** Vending and amusement machines are special equipment utilized by nonappropriated funds activities and, therefore, the additional power to operate them will be furnished from nonappropriated funds. Post engineers will render billings for all additional power required in the operation of vending and amusement machines. The charge will be determined in accordance with *c* below. Although it is permissible to furnish from appropriated funds the additional power necessary to operate special equipment at post messes and hospital messes, it is not permissible to so fur-

nish the additional power to operate amusement and vending machines at post messes and hospital messes inasmuch as AR 210-65 does not permit the purchase or operation of vending and amusement machines by post messes or hospital messes. Any such machines located in post messes or hospital messes must be operated by one of the authorized agencies specified in AR 210-65 and, therefore, will not be furnished additional power from appropriated funds.

c. RATES. All sales of electricity will be at prevailing local rates, or substantially equivalent rates, but in no case at less than the cost to the

Government. A simple rate for this purpose can be computed by obtaining from the local utility company a tabulation of demands, kilowatt hours, and costs for service to a similar customer, and then computing from that information a substantially equivalent rate based upon the kilowatt hours used. The rate of the local utility company upon which to predicate a rate for sales by the post engineer should be the rate that would most equitably serve the majority of the customers of the post engineer. Demand meters, time switches, or other complicated metering devices or schedules will not normally be supplied and used.

Section III. FUEL

5.18. Responsibility

a. COAL. The Chief of Engineers is responsible for specifications, determination of requirements, provision of funds, receipt, inspection and sampling, storage, issue, and distribution of coal, coke, and briquettes for utilities purposes in continental United States. The functions of receipt, inspection, sampling, storage, issue, and distribution are carried out by post engineers. The Quartermaster General is responsible for purchasing coal, coke, and briquettes. Only the Office of The Quartermaster General and coal purchasing depots are authorized to release information on coal purchasing policy. Neither the post engineer nor the service command engineer will communicate with the coal contractor unless requested by the coal purchasing depot.

b. EMERGENCY PURCHASE OF COAL. The service command engineer may authorize purchase of coal, coke, and briquettes to meet emergency needs. One copy of the purchase order must be submitted promptly to OCE, The Quartermaster General, and the appropriate coal purchasing depot.

c. LOCAL PURCHASES OF COAL REQUIREMENTS. (1) In accordance with an agreement between OCE and The Quartermaster General, commanding generals of service commands are authorized to approve the purchase of annual coal requirements of posts from funds available locally under the following conditions:

(a) Where the *total annual requirements* of blacksmith coal at the post is less than 20 tons.

(b) Where the *total annual requirement* of anthracite, bituminous, and/or sub-bituminous coal at the post is less than 45 tons.

(c) Where the *total annual requirement* of coke at the post is less than 20 tons.

(2) When coal is purchased locally under these conditions, it is not necessary to submit requisitions to OCE for approval before purchase is accomplished. Requisitions confirming all such local purchases will be submitted to OCE in duplicate.

The confirming requisition will carry the following notation on the face:

"The above requisitioned coal has been purchased locally. Annual requirements of (*insert type fuel*) estimated to be less than _____ tons. Do not duplicate."

d. GAS, INCLUDING LIQUEFIED PETROLEUM GAS. The post engineer at each installation is responsible for requirements, specifications, funds, purchase, inspection, storage, and distribution of natural and manufactured gas used for utilities purposes.

e. PETROLEUM PRODUCTS. The post engineer is responsible for determining requirements for petroleum products used for utilities at posts, camps, and stations, including outposts and separate detachments, in continental United States. The Quartermaster General is responsible for purchase, inspection, storage, issue, and distribution of petroleum products, containers, and drums. At station level, these functions are the responsibility of the post quartermaster. Post engineers will requisition liquid fuel (except liquefied petroleum gas) and lubricants for repairs and utilities from the post quartermaster or supply officer. Funds will not be cited on this requisition. The post engineer is responsible for maintenance and repair of permanently installed liquid fuel storage, handling, and dispensing equipment.

f. WOOD. The post engineer is responsible for specifications, determination of requirements, purchase, inspection, storage, issue, and distribution of wood and other solid fuels, such as charcoal, not purchased centrally through procurement directives issued by the Office of The Quartermaster General and used for utilities purposes in continental United States.

g. FUEL FOR EXPORT. For responsibility for fuel for export, see paragraph 5.19d.

5.19. Funds

a. COAL AND PETROLEUM PRODUCTS. Funds for coal, coke, briquettes, and petroleum products are made available by OCE directly to the Office of The Quartermaster General. However, where local purchase of coal, coke, and briquettes is au-

thorized (pars. 5.18b, 5.18c, and 5.20) funds of the post engineer are used.

b. ALL OTHER FUELS. Funds for all other fuels are made available to the post engineer by the service command or AAF. Requisitions for these fuels are not required by OCE.

c. USE OF REPAIRS AND UTILITIES FUNDS TO PROVIDE HEATING FUEL. Repairs and utilities funds will be used only to purchase fuel needed to provide adequate heat in occupied buildings (not more than 72° during hours of active use). Purchase of supplemental fuel, such as wood for fireplaces, is not properly charged against repairs and utilities funds. If facilities are inadequate, the most economical means of increasing the capacity with minimum use of critical materials will be determined.

d. PURCHASES FOR EXPORT. Fuel products for export are purchased under direction of The Quartermaster General. Funds for such products required for utilities purposes are made available by OCE directly to The Quartermaster General.

e. FUEL FOR TECHNICAL MILITARY ACTIVITIES. Fuel used for technical military activities, such as training and the operation of technical equipment in medical and dental clinics and laboratories, will be furnished from repairs and utilities funds without reimbursement.

5.20. Supply of Coal to Outposts and Other Separate Detachments

Wherever feasible, coal from the stock of the nearest established post will be used to supply outposts and other separate detachments at which length of stay or strength cannot be determined in advance. This method should be followed even where it is necessary to make a separate local contract for hauling coal from post to outpost. In such cases, the post engineer will include outpost requirements with the regular post requirements on annual or supplemental WD AGO Form 10-211, indicating under *Remarks* the tonnage to be used by the outpost. Where the above procedure is not feasible, local purchase may be made from funds available to the service command engineer. Such purchase should be held to a minimum. When an outpost must be supplied for an extended period of time and it is not feasible to supply coal from an established post, WD AGO Form 10-211 will be submitted through the serv-

ice command engineer to OCE, as a request for the outpost's coal requirements. (See par. 4.23.)

5.21. Records of Fuel Consumption

a. POST RECORDS. The post engineer will maintain adequate records of fuel consumption so he can anticipate need and determine operating cost and efficiency of plants and equipment. See TM 5-602 which outlines the approved method of maintaining such records.

b. MONTHLY INVENTORY. The post engineer of every War Department installation which forwards requisitions for solid fuel through a service command to the Chief of Engineers will prepare monthly, five copies of WD AGO Form 10-156 (Monthly Inventory of Solid Fuels) (Reports Control Symbol QKF-48). These copies will be distributed so as to arrive by the 7th day of the following month. The original and four copies will be forwarded to the commanding general of the appropriate service command. The commanding general of each service command will, after review and necessary correction, forward copies of the inventory report so as to arrive in the respective offices not later than the 15th day of the month. Corrections as to grade and quantity will be coordinated informally with the appropriate command having station jurisdiction. The report will be submitted with a letter of transmittal indicating the number of stations reporting. The original and one copy will be forwarded to The Quartermaster General, Attn: Fuels and Lubricants Division, and one copy will be forwarded to the Chief of Engineers, Attn: Repairs and Utilities Division. The following instructions will be observed by the post engineer in preparing the form:

(1) Inventory figures will be based on quantities on hand in storage areas as shown upon stock record card after posting records of all fuel received and issued.

(2) All inventory data based on stock record cards will be checked by frequent and careful surveys of fuel on hand in storage areas. Any inventory adjustment found necessary will be clearly indicated on the report.

(3) Quantities entered will be in net tons of 2,000 pounds and fractional tons will not be entered.

(4) Where inventory records at posts, camps,

and stations do not provide for detailed size break-downs as listed in this report, size designations may be crossed out and tonnages entered as HAND-FIRED and/or STOKER-FIRED separately for bituminous, sub-bituminous, and lignite. Similarly, anthracite coal may in such cases be reported as BUCKWHEAT and/or OTHER SIZES.

5.22. Maintaining Adequate Coal Supplies

a. POST ENGINEER. The post engineer will maintain an adequate supply of coal on hand or under contract to meet post needs during the entire fiscal year. If extra coal is required, the post engineer will submit WD AGO Form 10-211 as soon as additional requirements are anticipated. At each post, responsibility for obtaining contractors' compliance with delivery schedules and/or delivery regulations of the Solid Fuels Administration for War and for supervising accurate records of coal in transit, receipts, issue, and stocks on hand (the daily coal situation) will be centralized in one person.

b. SERVICE COMMAND ENGINEER. The service command engineer's responsibilities for coal supply include:

(1) Having enough competent fuel service engineers on his staff.

(2) Using effectively the sampling personnel of the U. S. Bureau of Mines.

(3) Insuring that post and service command inventory and shipment records are accurate.

(4) Insuring that the post engineer as receiving officer rejects coal not suited to the equipment, not meeting OCE specifications, or not originating from mine indicated in purchase order.

(5) Insuring that provision is made for well-drained, properly-surfaced, clean-storage areas, reclaiming poorly stored coal, storing new tonnage carefully, and keeping sizes separated.

(6) Insuring that posts are maintaining and reconditioning coal-handling equipment and repairing coal bins.

(7) Insuring that fuel-yard personnel is well-organized and trained and that supervision of receipt, inspection, sampling, unloading, storage, and delivery of coal is centralized in one qualified person.

(8) Insuring that provision is made for proper supervision of post requisitioning procedures.

(9) Insuring that coal is stored, handled, and distributed with a minimum loss through degradation.

5.23. Preparation of WD AGO Form 10-211

a. POST ENGINEER. The post engineer is responsible for preparation and submission of WD AGO Form 10-211. Annual requisitions will be submitted through the service command in time to reach OCE on the date specified yearly by OCE. Supplemental requisitions will be submitted as soon as additional coal requirements are anticipated and will cover additional requirements from the date of preparation to the end of the fiscal year.

b. INFORMATION REQUIRED. The kind and size of coal to be used and the type of equipment to be served will be listed on the reverse side of the form or on an attached sheet.

Example:

<i>Kind and size of coal or coke</i>	<i>Equipment</i>
Bituminous egg or lump coal	Warm-air furnaces
Bituminous slack or screenings	Central boiler plants
Bituminous slack coal.....	Industrial-type stokers
Bituminous nut coal.....	Army No. 1 stoves
Bituminous domestic stoker*	Small domestic stokers
Anthracite buckwheat coal.	Warm-air furnaces
Egg, stove, or nut-size coke.	Bake ovens

Full justification of the size or analytical specifications recommended for any post equipment which requires a special size or kind of coal will be given on the reverse side of the form or on a separate attached sheet.

c. SERVICE COMMAND ENGINEER. The service command engineer is responsible for preparing WD AGO Form 10-211 for the fuel requirements for new stations. This is done as soon as the necessary information can be obtained. A representative of the service command will frequently have to visit the site and obtain necessary data from the resident engineer. The form will be submitted to OCE as far as possible in advance of the date of activation.

* Anthracite is used generally only in the First, Second and Third Service Commands.

d. DEFINITION OF UTILITIES COAL. The term *utilities coal* as used in WD AGO Form 10-211 includes coal used for space heating, cooking, hot-water heating, boiler plants, and other repairs and utilities operations which are a responsibility of the post engineer under AR 100-80. It does not include coal for Ordnance Department and Chemical Warfare Service industrial establishments (armories, arsenals, and proving grounds), or coal required for locomotives, and locomotive cranes.

5.24. Requisitions to Cover Over Deliveries

The following information will be included with all requisitions for coal, WD AGO Form 10-211, which are submitted to cover over deliveries: Contract and purchase order numbers, name of contractor, size of coal, mine price of coal, transportation rate, and fiscal year of contract.

5.25. Service Command Review and Approval of WD AGO Form 10-211

WD AGO Form 10-211 will be critically reviewed in the service command by personnel familiar with the requirements for coal supply, size, and quality at the post. Coal requests will not be processed by clerical personnel without review and approval by appropriate technical personnel. Incomplete and inaccurate requests will not be transmitted to OCE.

Anything unusual must be fully explained and justified. Requests for a special kind, size, or quality of coal will be accompanied by the comments and recommendations of the service command combustion engineer, who must give full justification. The notation *Approved for Supply* is not considered sufficient comment.

5.26. OCE Form 423

OCE Form 423 (Annual Estimate of Fuel Required for Utilities Purposes) is no longer required. However, forms covering corrections to previously submitted reports or covering new installations will still be submitted. (This form may be obtained through Corps of Engineers channels.)

5.27. Review of Coal Contracts

In order to discharge responsibilities in connection with coal procurement properly, it is essen-

tial that service command engineers and post engineers review coal contracts and conditions attached thereto, pertaining to quality, size, and preparation; weights; substitutions; inspection, sampling, acceptance, rejection; penalties; variations from quantity specified; change in destination; and deliveries and shipping notices on coal.

5.28. Changes in Coal Contracts

All requests for changes in coal contracts must be submitted by post engineer through the service command engineer to the Chief of Engineers, Attn: SPEUF. Except as provided below, service command engineers are not authorized to deal directly with depots on contract changes. Post engineers are *not* authorized to deal directly with depots on changes in coal contracts. Requests for reduction in tonnage will contain the information listed in *b* below. Such requests will, if approved by the service command engineer, be forwarded to the Chief of Engineers. The depot will *not* be requested by the service command engineer to suspend shipments, in cases involving *reductions* in contracts, except as authorized in *a* below.

a. ACTION BY SERVICE COMMAND ENGINEERS. Service command engineers are authorized to make requests directly to coal purchasing depots for temporary suspension or change in rate of coal shipments for a period not to exceed 4 weeks. If a request for *cancellation of the undelivered balance of coal contract* or for *indefinite suspension* of shipments is approved by the service command engineer, after informal coordination with the appropriate command having station jurisdiction, he will advise the coal purchasing depot to suspend shipment pending action on the request by the Chief of Engineers and The Quartermaster General. The service command engineer will immediately forward the request to the Chief of Engineers.

b. REQUEST SUBMITTED TO THE CHIEF OF ENGINEERS. Requests submitted to the Chief of Engineers for cancellation of the undelivered balance of coal contracts and for indefinite suspension of shipments must include the following:

(1) Requisition number, contract and purchase order number, fiscal year of contract, name of contractor, mine price, transportation rate, size of coal, tonnage called for on original purchase

order, and list of changes to original purchase order.

(2) Approximate tonnage remaining to be delivered on the purchase order based upon the latest information on deliveries and coal in transit available at the post and the service command.

(3) Estimated requirements for the balance of the fiscal year for coal to be used for the same general purpose (for example, hand-firing).

(4) Total tonnage of the above coal on hand, and due on existing purchase orders after deducting the tonnage to be cancelled.

5.29. Sale of Heat and Fuel to Individuals

a. **AUTHORIZATION.** In accordance with AR 100-90, on written authorization by the commanding officer, heat and fuel *may* be sold *when available* to those listed in AR 30-2290 as entitled to purchase such services. Sales will be made f.o.b. the stockpile. Government transportation facilities will not be used to make deliveries off the post. The authority granted by this policy is permissive and not mandatory.

b. **SALE PRICE.** Sales will be made at prevailing local rate, but in no case will the sale price be less than cost to the Government, including freight and handling charges. Prevailing local rates means the predominating retail price charged by reputable firms in the locality of the post. Appropriate adjustment must be made in view of the fact that Army coal is sold from the stockpile at the post, whereas, retail dealers sell on a delivered basis.

c. **ESTIMATES.** Estimates of fuel needed for resale will be included on WD AGO Form 10-211.

5.30. Sale of Coal to Relieve Domestic Emergencies

In order to provide temporary relief for emergency conditions resulting from local shortages of fuel for civilian consumption, commanding generals of service commands are authorized to approve the sale of coal furnished for repairs and utilities purposes (AR 100-80) at class I, II, III, and IV installations when such coal can be spared without seriously impairing the ability of the installation concerned to perform its housekeeping responsibilities. The commanding generals of service commands will obtain the concurrence of the

appropriate Army Air Forces command prior to final approval of the sale of such coal at class III installations. The following principles will be observed in exercising the authority granted herein:

a. **DETERMINATION THAT EMERGENCY EXISTS.** Sale of coal will be approved only in cases where the regional representative of the Solid Fuels Administrator for War certifies that an emergency exists in a particular locality as a result of inadequacy of fuel to meet the minimum requirements of public health and safety and inability to obtain fuel from other sources. Such certification will specify the extent and duration of the emergency and the steps being taken to obtain relief. The making of such certification will not obligate the War Department to provide coal for civilian use; however, all sales made as a result thereof will comply with regulations of the Solid Fuels Administrator for War.

b. **QUANTITY APPROVED FOR SALE.** The quantity of coal that can be spared at a particular installation without seriously impairing the ability of the installation to perform its housekeeping responsibilities will be based upon consideration of the following factors:

(1) Local inventory.

(2) Information obtained from the coal purchasing depot regarding the availability of coal and the rate of replenishment of the supply at the installation concerned.

(3) Anticipated requirements at the installation concerned.

(4) Steps to be taken by others to alleviate the emergency.

c. **MANNER OF SALE.** The manner in which sale is to be made will be determined with the purpose of effecting the most expeditious and equitable distribution to consumers, subject to the following:

(1) *To whom sold.* The classes of consumers, distributors, or agencies to whom coal will be sold will be specified only after consultation with the regional representative of the Solid Fuels Administrator for War. In order to conserve the efforts of military personnel and the use of military equipment and to minimize interference with local commerce, it is desirable that distribution to consumers be effected through established local retail distributors wherever possible. Sales direct

to consumers will therefore be avoided, except in the following cases:

(a) Where it is deemed desirable to make direct retail sales to civilian employees of an installation.

(b) Where the consumer normally obtains coal from nonlocal sources in carload quantities.

(2) *How sold.* Sales will be made by direct negotiation by installation commanders. When sales are made to local retail distributors, the regional representative of the Solid Fuels Administrator for War will be consulted as to equitable distribution.

(3) *Prices.* Sales will be made at prevailing local rates, but in no case at prices less than the cost of the coal to the Government including freight and handling.

(4) *Payment.* Cash payment in full will be made before delivery. The proceeds will be deposited as appropriation reimbursements to the applicable Engineer Service, Army, appropriation under the reimbursement accounts as indicated in TM 14-702.

d. *REDELEGATION.* The authority granted hereunder to commanding generals of service commands may not be redelegated to installation commanders.

e. *AID ONLY TEMPORARY.* Commanders authorized to approve sales of coal under the foregoing will make it clear to local nonmilitary authorities that the War Department can extend only temporary aid pending prompt affirmative action by responsible nonmilitary agencies and that such aid can be extended only to the extent consistent with the performance of normal military functions.

f. *NOTIFICATION.* Commanding generals of service commands will notify the Chief of Engineers and The Quartermaster General, in turn, and the appropriate coal purchasing depot of the quantities of repairs and utilities coal sold under the provisions of this policy.

5.31. Redistribution of Excess Coal

a. Commanding generals of service commands are authorized to redistribute excess repairs and utilities coal at class I, II, III, and IV installations.

b. The following procedures will be used when

transferring excess coal from one station to another:

(1) Where coal requisitions and contracts previously approved can be reduced because excess coal has been received from other stations, OCE will be notified of the reductions at the earliest practicable date. The request for reduction will specify the requisition number and all pertinent data about the contract or contracts to which the reduction will be applied.

(2) Where transferred coal is needed at the station receiving it to cover additional requirements, the receiving station will submit a requisition covering the coal so received. The following notation will appear on the requisition: Above requisitioned coal received by transfer from (*name of station*) and is not to be purchased.

(3) OCE will be notified prior to transfer, sale, disposal, or declaration as surplus of coal in excess of 1,000 tons.

5.32. Surplus Coal

a. *AUTHORITY.* Commanding generals of service commands are authorized to declare as surplus to the War Department coal furnished for repairs and utilities purposes at class I, II, III, and IV installations. Repairs and utilities coal at discontinued posts, camps, and stations will be promptly transferred to an active installation or disposed of as surplus by commanding generals of service commands. Proper disposition will be made within 60 days of the discontinuance of any installation. (See par. 5.31.) In no case will coal be declared surplus and disposed of unless—

(1) A stock of coal exists which exceeds the estimated requirements of an installation for the current fiscal year and the first quarter of the succeeding fiscal year.

(2) It has been determined, in conjunction with the purchasing depot, that the coal is not needed at other installations or that reloading and shipment to another station are not economically feasible. The purchasing depot is responsible for determining whether other coal purchasing depots or naval installations in the vicinity have need for the coal.

If the conditions outlined exist, the coal need not be listed on circularization lists before being declared surplus. Coal declared surplus under the above conditions will be disposed of in the manner provided by WD Procurement Regulation 7.

b. NOTIFICATIONS. Commanding generals of service commands will notify the Chief of Engineers and The Quartermaster General, in turn, and the appropriate coal purchasing depot of the quantities of repairs and utilities coal disposed of or redistributed under these provisions.

5.33. Manufacturing Plants

For a list of facilities to which this policy applies, see paragraph 1.9.

a. FUNDS. Coal purchased locally and natural or manufactured gas for Ordnance Department and Chemical Warfare Service industrial armories, arsenals, and proving grounds are chargeable to funds available to the operating service. No reimbursement is made to the Ordnance Department from repairs and utilities funds for coal used for utilities purposes. Reimbursement is made to the Chemical Warfare Service from repairs and utilities funds for locally purchased coal for utilities purposes. Reimbursement is made to both the Ordnance Department and the Chemical Warfare Service from repairs and utilities funds for natural or manufactured gas for utilities.

b. REQUISITIONS. Coal requisitions for Ordnance Department and Chemical Warfare Service industrial armories, arsenals, and proving grounds will be prepared by an officer designated by the commanding officer of the establishment. They will be sent directly to the chief of the technical service concerned. The Chief of Ordnance will forward all requisitions directly to the Office of The Quartermaster General for purchase. The Chief of the Chemical Warfare Service will approve the quantity of coal to be used for manufacturing purposes and forward the requisition to OCE for approval of the utilities coal. OCE will then transmit the requisition to The Quartermaster General for purchase.

5.34. Locomotives and Locomotive Cranes

Fuel for locomotives and locomotive cranes is chargeable to Transportation Corps funds. Submission of requisitions for coal is not the responsibility of the post engineer. Such requirements will not be included on WD AGO Form 10-211 but will be requisitioned by the transportation officer through Transportation Corps channels.

5.35. Coal-handling Equipment

The Chief of Engineers is responsible for specifications, determination of requirements, provision of funds, and purchase, inspection, storage, and issue of coal-handling equipment other than motor vehicles. Responsibilities for motor vehicles will be in accordance with paragraph 4.38. High-lift dump trucks will *not* be used for coal-handling except under extraordinary circumstances where standard dump trucks cannot be used. Where high-lift dump trucks are *required*, they will be supplied without reimbursement upon requisition through Transportation Corps channels, and will be furnished the post engineer in the same manner as any administrative vehicle. (See par. 4.38.) New or second-hand high-lift dump trucks will not be purchased by post engineers. Canvas bags suitable for use in sampling of coal or for carrying coal have been made available by The Quartermaster General and can be obtained without reimbursement from service command engineer warehouses.

5.36. Permanently Installed Scales

a. TRUCK SCALES. Truck scales for weighing coal will be furnished to posts receiving shipments in excess of 10,000 tons per year by rail or 3,000 tons per year by truck unless all coal is consumed at one point, such as a general hospital. When special conditions warrant, posts receiving 5,000 to 10,000 tons of coal per year by rail may have a truck scale. Truck scales will be purchased locally from funds available to the post engineer.

b. RAILROAD TRACK SCALES. Railroad track scales will not be furnished to Army posts for weighing coal. Certified railroad weights will be accepted.

5.37. Coal Storage

In addition to rigid conservation in the utilization of coal, loss of coal through improper storage, handling, and delivery will be reduced to a minimum. The responsibility for receipt, inspection, sampling, unloading, storage, and delivery of coal will normally be centralized in one qualified man at each post who is experienced in coal yard operation.

a. CENTRAL COAL-STORAGE AREAS. A suitably graded, drained, and surfaced central coal-storage

area large enough for the maximum amount of coal to be stored will be provided where necessary. The general inactivation program will be considered in determining the size of this area. Bituminous material can be used to provide coal-storage areas.

b. COAL STORAGE AT POINT OF CONSUMPTION. Commanding generals of service commands, air forces, or air forces commands can approve use of open bins to replace coal boxes when such changes will result in more efficient operation. Necessary modifications in existing coal boxes may also be approved.

c. SERVICE COMMAND INSPECTIONS. In order to accomplish the objective of proper coal storage and handling, the service command fuel service engineer must periodically, critically review coal yard operations at all posts. The following items will be considered by him:

(1) Provision of properly stabilized coal storage area.

(2) Reduction of degradation losses in handling. This can be accomplished by reducing the number of times coal is handled (direct deliveries from car to bin wherever possible); by careful use of clam shells, loaders, and stackers to avoid breakage of coal; by holding to a minimum the shifting of coal in the yard; and by not moving prepared sizes of coal with bulldozers or other similar equipment.

(3) Proper compaction of coal consistent with kind, type, size, and analysis to reduce danger of spontaneous combustion and fully utilize storage area.

(4) Proper segregation of various sizes and kinds of coal.

(5) Provision of fire lanes and suitably surfaced access roads.

(6) Avoidance of overloading trucks and consequent spillage during delivery trip.

(7) Performance of periodic rescreening of degraded coal and its subsequent reuse.

d. HAND-PICKING OF COAL. Post commanders will issue instructions to the effect that *all* sizes of coal delivered must be used. Lamp coal must not be hand-picked from the bins and the fine coal thrown away.

5.38. Railroad Trestles

Railroad trestles will not be installed at a post

for coal delivery without specific authority from OCE.

5.39. Procedure Regarding Purchase of Coal

Coal which does not meet original OCE specifications will be purchased only on written waiver from OCE. The coal purchasing depot, assisted by the fuel service engineers and the Bureau of Mines coal sampler, will investigate where doubt exists as to the quality of the coal mined by a potential supplier. Representative analysis of the coal purchased will be shown on all contracts and purchase orders. When the acceptance of sub-standard coal is being considered by an installation, the post engineer and/or service command engineer will furnish the contracting officer with recommendations and all information necessary for him to negotiate an acceptable price adjustment. The Quartermaster General has instructed all depots to give due consideration to such recommendations. If a reasonable price adjustment cannot be obtained, the coal may be rejected by the post engineer in accordance with the conditions of the contract.

5.40. Purchase Orders, Delivery Orders, and Invoices

OCE does not require either the original or copies of purchase orders, delivery orders, or invoices for petroleum products, natural and manufactured gas, coal, or any other supplies or equipment purchased locally, except for emergency purchases of coal which must be confirmed by a copy of the purchase order as outlined in paragraph 5.18b.

5.41. Receiving Reports

Receiving reports are to be executed as provided for in AR 35-6560 within 3 days after the date of delivery and acceptance at destination. Receiving reports will be prepared and distributed to the purchasing depot in the manner and as prescribed by the depot. Additional copies will be prepared and distributed as required by the chiefs of the technical services.

a. WHEN SAMPLED. In cases where shipments are sampled, the appropriate one of the following notations will be made upon receiving reports to indicate by whom the sample was taken:

(1) The coal covered by this receiving report

has been sampled by or under the immediate supervision of a representative of the United States Bureau of Mines.

(2) The coal covered by this receiving report has been sampled by or under the immediate supervision of the fuel service engineer.

(3) The coal covered by this receiving report has been sampled by post personnel.

b. WHEN NOT SAMPLED. In cases where shipments are not sampled, the following notation will be made on receiving reports: The coal covered by this receiving report has not been sampled.

c. GUARANTEED ANALYSIS CONTRACTS. Receiving reports covering coal shipped pursuant to guaranteed analysis contracts will be prominently marked with the notation: GUARANTEED ANALYSIS CONTRACT.

d. PREVENTION OF DELAYS. To insure prompt and correct preparation of receiving reports for coal, action will be taken to establish the following procedure at all installations:

(1) One person directly connected with the coal yard, normally the superintendent, will be made responsible for furnishing all necessary data to the property section.

(2) The coal yard will be furnished copies of all contracts and purchase orders or the necessary data extracted therefrom to identify shipments and accomplish receiving reports.

(3) The coal yard will be furnished waybills, freight bills, or necessary data extracted therefrom, to establish name of shipper, name of mine, billing point, car initials and numbers, size and weight of coal.

(4) The coal yard will be furnished with the shipping notices immediately upon receipt.

(5) The coal yard will furnish the property section with a pencil copy of WD AGO Form 10-113 with all data necessary for the preparation of the formal receiving report. A separate report will be made for each shipment under each contract. A shipment is defined as the amount received at any one time and may consist of any number of cars. The contractor's name, the carrier, the car initials and numbers, the contract and purchase order number, the Government bill of lading number, the quantity, type (bituminous, sub-bituminous, lignite, anthracite) and size of coal received and its unit cost will be noted on the pencil copy. This form will be prepared and

forwarded to the property section within 1 day of the receipt of the coal.

(6) The property section will prepare and forward the formal receiving report within 3 days of the receipt of the shipment in accordance with this paragraph.

(7) The coal yard representative will cooperate with the transportation officer in the matters of ascertaining the weights, origin, etc., of the coal received.

5.42. Inspection and Sampling

a. INSPECTION. The post engineer, a commissioned assistant, or a qualified civilian assistant will visually inspect coal, coke, and briquettes for utilities purposes to determine that it is the grade and size contracted for, and that it is reasonably free from bone, slate, and other foreign matter. Shipments found to be definitely substandard as to size, preparation, or purity will be rejected. Communications regarding rejections will be sent by the post engineer through the service command engineer to the appropriate coal purchasing depot which will notify the contractor to remove the coal from the reservation. Usable substandard coal may be accepted, subject to price adjustment made by the appropriate purchasing depot based upon recommendation of the service command fuel service engineer.

b. SAMPLING. Initial shipments on contracts for 500 or more tons of coal, coke, or briquettes will be sampled at the destination and subsequent samples will be taken of each additional 5,000 tons delivered. Samples on contracts amounting to less than 500 tons may be taken on trial shipments or where the analytical information is desired. Where analysis or use of coal, coke, or briquettes indicates substandard quality, succeeding shipments will be sampled continuously until they meet specifications or until a request is made for contract cancellation. The following procedures apply to sampling:

(1) Coal will be inspected and sampled at destination except when directed by the Chief of Engineers, who may direct the inspection and the taking of samples at the mine or at the shipping point in the event it is considered sampling can be more efficiently accomplished at such points, or if it is requested by a coal purchasing depot which is in doubt as to the quality produced by

the supplier. Inspection and sampling done at mines will be coordinated through the depot purchasing and contracting officer.

(2) Bureau of Mines coal samplers assigned to each service command will be utilized by service command engineers where there is any question as to the contractor's ability to meet specifications or the guaranteed analysis, or where difficulties are being experienced in the use of coal, coke, or briquettes.

(3) The samples covering *each* contract will be numbered consecutively beginning with No. 1, regardless of the size of the coal, the originating mine, or the agency taking the sample. The fol-

lowing symbols will be added to the consecutive number to indicate by whom the sample was taken:

U—Samples taken by post engineer personnel.

FSEU—Samples taken by service command fuel service engineers.

MU—Samples taken by Bureau of Mines samplers.

(4) Notations on Bureau of Mines Form 6-220 will be made showing the fiscal year of the contract represented by the sample.

Section IV. HEATING

5.43. Conservation of Fuel

a. MEASURES. The following measures have been approved by The Surgeon General and will be enforced to reduce fuel consumption:

(1) Prevent overheating of buildings, using temperature-control equipment when available. If there is no automatic temperature control, regulate the heat source to conform to outdoor weather conditions by operating firing devices or distribution-line valves manually. Sleeping quarters or other spaces not actively used at night will not be heated to temperatures above 55°.

(2) Keep windows and doors of cantonment and theater of operations buildings closed during heating seasons except under the following circumstances, where thermostats will be placed on the lowest settings:

(*a*) During sleeping hours.

(*b*) During short periods not over 30 minutes to ventilate excessive dust, such as that caused by sweeping.

(*c*) Special ventilation ordered by a medical officer instead of or after fumigation or sterilization against contagious disease.

(*d*) When outside temperature is 65° F. or higher.

b. FUEL-CONSUMPTION CONTROL. The post engineer will report any instances of excessive fuel consumption resulting from neglect, carelessness, intentional waste, or unnecessary operation of heating equipment to the post commander.

5.44. Operating Personnel for Heating and Boiler Plants

Repairs and utilities responsibilities of the Commanding General, ASF, accomplished through commanding generals of service commands for class I, II, and IV installations, and the Commanding General, AAF, accomplished through air forces and commands for class III installations, include furnishing heating services in accordance with established policies.

a. INTENT OF POLICY. The intent of this policy is to provide civilian operators for all large heating plants and civilian firemen for small heating plants where their service will release military

personnel for field duty or will prevent serious interference with training. (See *d*, *e*, and *f* below.)

b. EXTENT OF COVERAGE. This policy will govern employment of operating personnel for heating and boiler plants at all installations at which repairs and utilities are accomplished in accordance with AR 100-80. It will not apply to Ordnance Department and Chemical Warfare Service plants, arsenals, and proving grounds, where operation, maintenance, and repair of boiler plants are the responsibility of the respective technical services by agreement with the Chief of Engineers, pursuant to AR 100-80.

c. FUNDS. Repairs and utilities funds will be used to pay civilians employed under this policy by the War Department to fire heating plants, boiler plants, and space heaters.

d. WHERE CIVILIAN PERSONNEL WILL BE USED. Civilian personnel will be employed to operate—

(1) All heating and boiler plants having a total rated capacity of more than 100 horsepower (hp) or equivalent Btu rating.

(2) Heating and boiler plants having a total rated capacity of less than 100 hp or equivalent Btu rating, and individual stoves and heaters only for—

(*a*) Special facilities, such as AAF, ASF, or AGF technical or factory schools, laboratories, War Department theaters, and post offices on a post. Where the facility is part of the post, firemen will be provided only for the excepted facility unless otherwise provided below.

(*b*) Dormitory type civilian quarters and community buildings under War Department jurisdiction.

e. WHERE CIVILIAN PERSONNEL MAY BE USED. Upon service command or AAF command approval, civilian personnel may be employed to operate heating and boiler plants in—

(1) Warehouses. When possible, however, personnel engaged in regular warehouse and depot operation will be utilized.

(2) Post administrative headquarters where no station complement is available. Regularly as-

signed operating or custodial personnel will, however, be utilized as much as possible.

(3) Buildings occupied by patients at reconditioning centers. Use of patients to fire heating plants is not in accord with the policy of the Office of The Surgeon General.

f. WHERE CIVILIAN PERSONNEL WILL NOT BE USED. Civilian personnel will *not* be employed to operate heating and boiler plants in—

(1) Organizational buildings, such as barracks, quarters, day rooms, administration buildings, mess halls, bathhouses, and lavatories. These facilities will be fired by the field force unit or station complement to which the buildings are assigned.

(2) Buildings where personnel are present and available, such as fire stations, small warehouses, guardhouses, and garages.

(3) All officers' and noncommissioned officers' quarters. If civilian firemen are used in these facilities, they will be paid by the occupants.

(4) Residential type civilian quarters.

(5) Profit-making organizations, such as service clubs, post exchanges, and officers' clubs, and welfare agencies such as Red Cross and YMCA. If civilian firemen are used in these facilities they will be paid by the using agency.

g. ATTENTION REQUIRED WHERE FULL-TIME OPERATOR IS NOT PRESENT. The instructions set forth in the tabulation below will govern operating service for small automatically-fired heating plants where a full-time operator is not considered necessary. Modifications required by unusual operating conditions may be made by the service command or air force command without reference to OCE.

Operating service for small automatically-fired heating plants

Type	Size	Maximum operating pressure	Typical use	Fired by	Minimum recommended operations service visits
Steel fire-tube and CI boilers.	Up to 7,000 sq ft. EDR.	Under 15 psi ga steam; 30 psi ga for hot water.	Space heating..	Stoker....	Two times per day.
Steel fire-tube and CI boilers.	7,000 to 14,000 sq ft. EDR.	Under 15 psi ga steam; 30 psi ga for hot water.	Space heating..	Gas or oil.. Stoker....	Two times per day. Four times per 8 hr. operating shift.
Vertical fire-tube..	3 to 15 hp....	Over 15 psi ga and less than 100 psi ga.	Sterilizing	Gas or oil..	One per day.
Vertical fire-tube oil field and fire box type boilers.	15 to 100 hp..	Over 15 psi ga and less than 100 psi ga.	Mess hall cooking.	Gas or oil.. Stoker....	Two times per 8 hr. operating shift. Four times per 8 hr. operating shift.

h. SOLDIER FIREMEN. Enlisted personnel may be assigned to fire furnaces in categories listed in *e*, *f*(1), and *f*(2) above, provided they have been trained by the post engineer at facilities which he provides. When practical, firemen should be assigned for at least 30 days.

i. UTILIZATION OF BOILER PLANT PERSONNEL. Boiler plant operators will not normally be employed on regular shifts when steam is not actually required. The number of operators on each shift will be revised, if necessary, to conform to the light load requirements of summer operation. Manpower not essential to actual operating process by virtue of reduced daily or seasonal operation should be used effectively to recondition the plant equipment and the distribution system.

5.45. General Mechanics, Heating

General mechanics, heating, will be assigned to inspect and repair small heating plants and to instruct firemen.

5.46. Combustion Engineers

a. SERVICE COMMAND COMBUSTION ENGINEERS. Service commands will coordinate and direct the activities of the combustion engineers to obtain maximum effectiveness in training and assisting post personnel and insuring proper utilization of the fuel supply. Combustion engineers are responsible for determining whether established heating procedures are being followed. Duties of the combustion engineers will be as follows:

(1) Periodically visiting posts in accordance with existing regulations to give technical assistance to post personnel on all phases of operation and maintenance of heating equipment.

(2) Assist in training post personnel in proper practices and procedures for operating heating equipment.

(3) Ascertaining that administrative control and personnel for operating and maintaining heating plants are properly instructed in their duties.

(4) Assisting post engineer personnel in establishing maintenance programs and training courses.

(5) Inspecting heating equipment, reviewing operating practices, and making recommendations as required.

b. USE OF INDUSTRIAL COMBUSTION ENGINEERS. Since personnel is limited both in service commands and posts, combustion engineers of Bituminous Coal Research, Inc., and Anthracite Industries, Inc., may be used to assist service command and post engineers.

5.47. Service by Local Utility

To reduce gas consumption at camps, posts, and stations, the gas supplier will be requested in writing to inspect and report on the following services:

a. Adequacy of post distribution facilities; need for further looping of systems to decrease pressure drop; and materials needed for sectionalizing distribution facilities to repair leaks in mains.

b. Operating condition of gas-burning equipment, including regulators, piping, controls, and air-gas mixtures.

c. Flue-gas analysis of larger installations, including wherever practicable those using fuels other than gas.

5.48. Summer Maintenance

In order to achieve maximum fuel conservation by improvement in fuel utilization, action will be taken to accomplish the summer overhaul of heating equipment, to establish a preventive maintenance program in accordance with the provisions of TM 5-641, 5-643, 5-645, 5-647, 5-649, 5-651, and 5-653 (when published), and to institute a comprehensive training program for heating mechanics and soldier firemen.

5.49. Temperature-control Equipment

a. BUILDINGS SERVED FROM CENTRAL PLANT. Automatic space temperature-control equipment is essential to efficient operation of heating systems and conservation of fuel. The following policy governs installation of temperature-control equipment in existing buildings in hospital areas or others served from a central plant:

(1) Quarters and general-purpose buildings will be grouped, where practicable, and equipped with controls actuated by outside temperatures.

(2) Storehouses and similar buildings will be controlled by individual outside thermostats.

(3) Wards and clinical buildings will be controlled either by inside thermostats or outside temperature. Where wide variations in temperature or building construction make outside control more desirable, the possibility of using them will be carefully checked with the post surgeon.

b. AMORTIZATION OF COST. Temperature-control equipment will be installed only where cost, including material and labor for the complete installation plus estimated maintenance cost for 3 years, can be amortized in 3 years. (Estimate a 15 percent saving of total plant fuel consumption by use of temperature-control equipment.)

5.50. Procurement of Kitchen Ranges and Heating Equipment

a. KITCHEN RANGES. Kitchen ranges will be supplied through Quartermaster channels.

b. ARMY NO. 1 SPACE HEATERS. Army No. 1 space heaters and economizers will be requisitioned from service command engineer.

c. REPAIR PARTS. Repair parts for the following will be requisitioned from the service command engineer: Nos. 15, 18, and 20 Cannon stoves and Army No. 1 space heaters. Repair parts for other heating equipment will be procured locally.

d. BOILERS AND FURNACES. Boilers and furnaces for space heating, hot-water heating, and utility steam generation will be purchased locally.

e. FUEL AUTHORIZATION. Heating or cooking equipment using a fuel (coal, oil, or gas) other than that which has been authorized as a principal fuel for the proposed use at the particular installation will not be installed or converted without the prior approval of the service command engineer. The installation or conversion of any such

equipment which will materially increase requirements for a particular fuel also must have prior approval of the service command engineer. The term *principal fuel* will not be construed to apply to fuel which represents less than 25 percent of the total requirements for any particular use. The above conditions also apply to electrical heating and cooking equipment.

f. CONTROL INSTRUMENTS. Generally controls will be repaired by replacing them from stock and returning damaged units to the manufacturer for exchange or repair. Field repairs on controls are generally unsatisfactory.

5.51. Boiler Equipment

a. BOILER TRIM. The arrangement and design of all boilers, boiler fittings, and appliances, such as safety valves, stop valves, blow-off piping, feed piping, and water column piping, will conform to the ASME Boiler Construction Code. Duplicate feed-water systems, special blow-down valves, safety-valve relieving gear, and similar appliances not required by the ASME Code will not be installed without OCE approval.

b. FIRING EQUIPMENT. Firing equipment will be designed to provide sufficient capacity to operate fire-tube boilers at 125 percent of mechanically-fired Steam Heating Boiler Institute (SHBI) rating and water-tube boilers at 200 percent of ASME rating.

5.52. Boiler Plant Performance

a. CENTRAL HEATING PLANT LOGS. All central heating plants will keep an operating log available at all times for review by post engineers or service command combustion engineers. This log will contain all pertinent information on operation and maintenance of the plant. It will indicate major maintenance projects and will contain a daily operating record, including fuel consumption and steam produced, boiler outage schedules, and cleaning and repair periods.

b. BOILER EFFICIENCY. Under average conditions, no less than 10 percent carbon dioxide for coal- and oil-burning installations and 8 percent for gas-burning installations will be maintained. Coal-burning installations having instruments and automatic combustion control will, however, operate at 12 to 13 percent carbon dioxide. All damper controls must be properly regulated to in-

sure minimum use of excess air. Rate of fuel consumption will be carefully adjusted to meet load requirements. Boiler tubes and flues will be kept clean to insure maximum heat transfer.

c. UTILIZATION OF WASTE STEAM. Excessive venting of exhaust steam from flash tanks and back-pressure valves will be eliminated. High-pressure traps will be inspected regularly for proper operation. Exhaust steam from auxiliaries, flash tanks, and other sources will be connected through safety devices to low-pressure steam mains for space and hot-water heating.

d. INSULATION OF DISTRIBUTION SYSTEMS. Radiation caused by poorly insulated surfaces will be eliminated, particularly in underground piping. Precautions will be taken to prevent flooding of underground pipe tunnels and conduits. Should flooding occur, conduits will be drained at once. Damaged pipe covering will be repaired or replaced wherever possible.

5.53. Boiler-water Treatment

a. BUREAU OF MINES TREATMENT. Army installations at which repairs and utilities responsibilities are performed in accordance with AR 100-80 will use the boiler-water treatment recommended by the Bureau of Mines and follow instructions outlined in TM 5-650 (when published). If other stations use the Bureau of Mines treatment, they will comply with established procedure. Engineers in OCE and service commands will assist them on request.

b. EXCEPTIONS. High-pressure steel boilers of less than 10 hp will receive boiler feed-water treatment only when the service command considers it necessary. To protect *low-pressure* boilers with minimum attention, responsibility for preventive maintenance is delegated to the service command engineer; where needed, he will require treatment and submission of samples to the Bureau of Mines according to the procedure in TM 5-650.

c. TRADE-NAME COMPOUNDS AND PRIVATE CONTRACTS. (1) Use of trade-name compounds and contracts for private handling of boiler-water treatment are not authorized. On approval of the service command, exceptions will be authorized when additional treatment is required to meet a special condition. (See TM 5-650.)

(2) Coravol will be used only with approval of the service command. The Surgeon General

authorizes its use where steam comes in direct contact with food only if Coravol is *never* added to the boilers within 1 hour of the use of direct-contact steam cookers. Where Coravol is used, precautions will be taken to comply with this requirement.

d. SERVICE COMMAND BOILER-WATER ENGINEER. The service command boiler-water engineer is responsible for—

(1) Determining whether established directives on boiler-water treatment given in TM 5-650 are being followed.

(2) Recommending treatment at posts to maintain recommended chemical limits.

(3) Helping train post personnel in the proper use and handling of the chemicals.

(4) Providing post personnel with technical assistance in operating and maintaining all water softeners except those for the post water supply.

e. BOILER-WATER HYDROMETERS. Broken boiler-water "Pacometer" hydrometers will be replaced by sending them *complete with leather case* to: The Permutit Company, 330 West 42d Street, New York (18), New York. The purchase order to the Permutit Company will be for \$15. The service command boiler-water engineer will assist the posts where calibration of hydrometers is the only defect. Hydrometers will not be shipped to the Bureau of Mines for repair or calibration.

5.54. Improvements to Boiler and Heating Plants

Coal conveyers and soot blowers will be provided wherever the labor saved warrants their installation. Soot blowers should also be installed where removing boilers from service to clean tubes interferes with operation.

5.55. Boiler-feed-equipment Requirements

Specifications governing 700- and 800-series laundry and hospital boiler houses call for installation of two boiler-feed pumps, each pump having enough capacity to meet the plant's maximum load requirements. Since all installations made in accordance with these specifications provide a spare pump, they comply with the ASME Code. Therefore, additional boiler-feed equipment, such as injectors, is unnecessary. In plants not equipped with feed-water heaters but equipped with both

electric- and steam-driven boiler-feed pumps, the steam-driven pump should be used only in emergencies or during necessary shut-downs of the electric-driven equipment, since no facilities are available for using exhaust steam.

5.56. Spare Boiler-plant Capacity

a. POLICY. The following policy will determine need for additional boiler capacity. This policy provides a margin of safety for emergency conditions while eliminating unnecessary stand-by boiler equipment.

(1) Plants containing water-tube boilers will be considered satisfactory when maximum load can be carried with all boilers operating at 150 percent of rating.

(2) Plants containing steel fire-tube boilers will be considered satisfactory when maximum load can be carried with all boilers operating at normal rating.

(3) Plants containing cast-iron boilers will be considered satisfactory when maximum load can be carried with all boilers operating at normal rating.

b. ADDITIONAL BOILERS. When necessary, additional boilers will be provided to meet the above conditions.

c. LOAD DETERMINATION. The following may be used to compute load determination on heating plants where flow meters or other test data are not available:

(1) Heating load is totaled and its steam demand on the heating plant determined using 100 percent load factor.

(2) Utility steam such as for domestic hot-water, sterilizing, and kitchen equipment is assumed to have a load factor of 65 percent.

(3) In determining total demand on hospital plants, line loss is taken at 21 percent of total connected load. This includes line loss for the distribution system and for the various buildings.

(4) Demand due to pick-up is taken as zero, on the basis that steam is always on the system.

(5) On laundry-boiler plants, steam demand may be taken as 100 percent of the total connected load with no allowance for pick-up on line loss.

d. APPLICATION. The above policy will be followed only for additions or replacements at installations where repairs and utilities responsibilities

are performed in accordance with AR 100-80. It does not apply to new construction projects or to Ordnance Department and Chemical Warfare Service plants, arsenals, and proving grounds where operation, maintenance, and repair of boiler plants are responsibilities of the respective technical services.

5.57. Instruments for Boiler Plants

The following recommendations will guide the selection of boiler-plant instruments; modifications may be made to suit individual conditions.

a. COMMON TO ALL BOILERS. (1) Steam-flow meters. A steam-flow meter should be installed on each 300-hp and larger boiler or on the main header from a group of boilers totaling 300 hp and larger where individual meters are not used. Flow meters should not be used on main headers unless the cost of necessary piping changes is moderate. A steam-pressure recorder to record pressure in main headers should be combined with one of the flow meters.

(2) Steam-flow air-flow meters. For 300-hp or larger boilers, a steam-flow air-flow meter may be installed in place of a steam-flow meter and carbon dioxide recorder.

(3) Temperature recorders. One combination carbon dioxide and flue-gas temperature recorder should be installed for each 300-hp or larger boiler. When individual recorders are not used, one carbon dioxide recorder connected by a manifold to each boiler of a group totaling 450 hp or larger should be installed. Flue-gas temperature recorders on breechings common to several boilers are of limited value. To obtain the temperature of flue gas leaving a group of boilers not having individual carbon dioxide and flue-gas temperature recorders or steam-flow air-flow meters, a thermocouple for the last pass of each boiler, one selector switch, and one indicating type pyrometer may be installed.

(4) Flue-gas analysis set. At least one portable flue-gas analysis set should be available on each post to determine carbon dioxide on miscellaneous boiler units and to check recording equipment.

b. COAL-FIRED BOILERS. Draft gauges should be installed on 100-hp and larger boilers, and automatic draft controls should be installed on 150-hp and larger boilers.

c. OIL- AND GAS-FIRED BOILERS. (1) Flue-gas analysis set. One portable flue-gas analysis set should be available per boiler room of 150- to 450-hp capacity.

(2) Draft gauges. Draft gauges should be installed on all 50-hp and larger boilers. Automatic controls should be installed for primary and secondary air for oil-burning equipment using No. 5 or No. 6 oil. For installations using lighter oils, chimney draft should be regulated by barometric type balanced dampers.

(3) Gas meters. Gas meters should be installed on boiler plants having steam-flow meters.

5.58. Boiler Inspection

Boiler inspections required by AR 850-300 will be performed by an inspection agency approved by OCE. Inspections should be spread out over the entire year as much as possible to equalize the work load and make it possible to use one inspector in the same area all the time. Inspections will usually be both internal and external, followed or preceded by an external inspection under steam pressure. Boilers in questionable condition or those over 5 years old will be given an internal and external inspection followed or preceded by an external inspection while under hydrostatic test. To simplify inspection procedure for other establishments, service commands will coordinate inspections at Army installations at which repairs and utilities responsibilities are performed in accordance with AR 100-80. Post commanders at such stations are authorized to request the service command engineer directly for services of these inspectors. Rendering this service at such stations will not be construed to place any responsibility for operation or maintenance on the service command engineer. Inspections on locomotives and locomotive cranes will be handled by the Transportation Corps. In instances in which the United States has acquired exclusive jurisdiction over military reservations, State laws as to the inspection of boilers are not applicable, the inspection of boilers being a responsibility of United States. (See Vol. III, No. 2, ch. 19, Bulletin of The Judge Advocate General of the Army, Feb. 1944.)

5.59. Stoker Equipment

Stokers may be installed under any boiler or fur-

nance provided savings in labor and fuel will amortize the total cost of installation within 3 years. When the use of stokers is authorized, they will have enough capacity to operate fire-tube boilers at 125 percent of SMBI mechanically-fired rating and water-tube boilers at 200 percent of ASME rating.

5.60. Hot-water Building Heating Systems

Hot-water building heating systems will have proper controls and relief valves to prevent overheating.

5.61. Furnace-fan Operation in Summer

Circulating fans on forced warm-air systems not in heating service during the summer months will be adjusted so they cannot be operated during these months except in theaters and similar buildings designed for summer ventilation.

5.62. Air Filters

Except in extremely dusty areas, filters in the return-air plenum of forced-circulation heaters are of no practical value in conserving health. Upon concurrence of the post surgeon, the use of filters will be discontinued wherever possible.

5.63. Accessories for Small Heating Plants

Coal hods and bags, shovels, pokers, and ash hoes will be requisitioned from the service command engineer.

5.64. Heating in Hospital Corridors

Connecting corridors in hospitals in areas having more than 2,500° days will be heated to 55° F. Connecting corridors in areas having less than 2,500° days will not be heated except in cases of unusual exposure. Where freezing temperatures may occur at any time and no heat is provided, sprinkler piping in corridors will be protected by 1½-inch to 3-inch valved steam lines running parallel and close to sprinkler lines. Corridor space inside hospital buildings may be heated.

5.65. Operation and Maintenance of Laundry Facilities

a. POST ENGINEER. The post engineer is responsible for:

(1) Maintaining and operating laundry boiler plants.

(2) Maintaining steam-distribution lines, traps, etc., in the laundry building, up to the connection entering the laundry machine and beyond the connection leaving the machine.

(3) Operating, providing operating supplies, adding to, and servicing water softeners and water heaters for laundry purposes, wherever installed.

(4) Maintaining electric power lines in the laundry up to the machine, including replacement of fuses and maintenance of circuit breakers.

(5) Maintaining and repairing all water lines, valves, faucets, etc., in the laundry, up to the control valves on the laundry machines.

(6) Maintaining all drains, sewers, and traps serving the laundry.

b. POST LAUNDRY OFFICER. The post laundry officer is responsible for:

(1) Maintaining laundry machines.

(2) Maintaining motors and other electrical equipment on the machine side of the fuse box or circuit breakers.

(3) Maintaining control valves and other water-supply equipment on the machine side of the control valves.

c. REPAIRS. Under the combined shop loan, post engineer maintenance shops and utilities personnel may be used to repair equipment for which the post supply and service officer is responsible.

d. STEAM PRESSURE IN LAUNDRY BOILER PLANTS. For efficient operation, minimum steam pressure of 100 psi will be maintained at the equipment in laundry boiler plants. Laundry boilers will be operated at enough pressure above 100 psi to compensate for pressure losses between boilers and laundry equipment; however, the maximum safe working pressure of the boiler approved by the boiler inspector must not be exceeded. As a means of maintaining sufficient steam pressure in laundry boiler plants The Quartermaster General has concurred in a recommendation that consideration be given to the removal of safety valves from modern safety type, flat-work ironers. The post engineer will make any necessary arrangements with the post laundry officer for the removal of such valves where operating difficulties exist.

5.66. Warehouse Heating

a. WHEN AUTHORIZED. Warehouse heating will be authorized where required by operations performed in them or to protect perishable material against freezing. However, before heating facilities are requested between fire walls in any warehouse section, the using service will submit evidence to the post engineer to show that operations in each section cannot be performed in other sections which are already heated or for which heating is proposed.

b. DEGREE OF HEATING. Although the percentage of warehouse space which may be heated is not limited, every effort will be made to follow the recommendations below so heated areas will be at a minimum. Maximum temperatures are as follows:

(1) 70° F. for all office space, toilet rooms, and areas where many employees work seated or standing on jobs involving little exercise.

(2) 55° F. for sections where many employees work entirely inside, standing and exercising moderately; such work includes sorting, collecting into and from bins, etc.

(3) 40° F. for sections where employees do work involving considerable exercise, such as packing, crating, and stacking, or where heat is required to protect material from freezing.

(4) No heating will be permitted in sections which do not contain material requiring protection from freezing, and where the only operations are placing and withdrawing stored goods.

c. JUSTIFICATION. Requests for heating facilities will include complete justification as follows:

(1) Complete outline of present and proposed heating facilities.

(2) Description of operations performed in all warehouse space for which additional heating facilities is requested.

(3) Maximum, minimum, and average outside temperature for winter season for past 5 years taken from Weather Bureau records.

(4) Floor-plan sketch of all warehouse facilities showing areas and number of employees as follows:

(a) Number working seated with minimum exercise, such as office work, or standing with little exercise, such as filing.

(b) Number standing with moderate exercise, such as sorting or working at assembly tables, bins, etc.

(c) Number standing with considerable exercise, such as packing, crating, boxing, stacking, and loading.

(d) Storage areas where employees are present only occasionally.

d. SCREENING OF REQUESTS. Requests for additional heating will be screened with extreme caution, and no requests will be considered if other means can be used. Questions on proper use of warehouse space at posts, camps, and stations will be referred to the appropriate service command for review and recommendation by the technical service representative; those involving class IV installations will be referred to the office of the chief of technical service for review and recommendation.

5.67. Manufacturing Plants

At industrial sections of Government-owned and operated Chemical Warfare and Ordnance Department armories, arsenals, and proving grounds, maintenance, repair, and operation of gas generating plants, inside gas-distribution systems (except those used for heating, cooking and lighting), and boiler-plant and steam-distribution systems are an operating service responsibility. Maintenance, repair, and operation of outside gas-distributing systems at these installations are a repairs and utilities responsibility. Mechanical engineers in OCE and in the service command engineer's office will be available on request to assist in problems of operation and maintenance. For a list of facilities to which this policy applies, see paragraph 1.9.

Section V. REFRIGERATION

5.68. Refrigerated Warehouse Facilities

a. STORAGE SPACE. The Office of The Quartermaster General has set the following standards for an approximate upper limit. They may be reduced if local conditions warrant.

(1) *Stations under 3,000-man troop strength.*

(a) Frozen-food storage space (10° F.)—one prefabricated frozen-food storage refrigerator, type KE-25-27, 275-square-foot.*

(b) Cooler storage space (30° F. and over)—0.4 square foot per man.

(2) *Stations of 3,000- to 5,000-man troop strength.*

(a) Frozen-food storage space (10° F.)—one prefabricated frozen-food storage refrigerator, type KE-25-28, 550-square foot.*

(b) Cooler storage space (30° F. and over)—0.4 square foot per man.

(3) *Stations over 5,000-man troop strength.*

(a) Frozen-food storage space (10° F.)—0.1 square foot per man.

(b) Cooler storage space (30° F. and over)—0.3 square foot per man.

b. HOSPITALS. The above policy does not apply to general hospitals or station hospitals not served by post quartermaster facilities. The post engineer will correct essential refrigerated-storage deficiencies where necessary to meet the requirements of the individual hospital.

c. STORAGE-ROOM TEMPERATURE. Frozen-food storage rooms will be used only for storing food received frozen; they will not be used to freeze food. Temperatures in these spaces will not exceed an average of 10° F. Cooler storage rooms will not operate below 30° F.

d. BRINE-SPRAY UNITS IN COLD-STORAGE ROOMS. Only sodium chloride brine solution will be permitted in brine-spray units serving cold storage rooms for perishable food. Inhibitors for corrosion and rust control are harmful to food products and their use in brine-spray units delivering air to food-storage spaces will not be per-

* Applies only to stations served from market center so distant that frozen food must be picked up 5 days or more in advance of issue.

mitted. Rust and corrosion of metal surfaces in these units will be controlled where necessary by applying a suitable protective paint.

e. MEAT HOOK OVERHEAD MEAT TRACKS, AND TRACK SCALES. Trolley type meat hooks which become a fixed part of the cold-storage warehouse will be provided by the post engineer. One trolley type meat hook per foot of overhead meat track in cold-storage rooms is adequate. Plain, removable, hookover type meat hooks are quartermaster equipment and will be provided by the post quartermaster (supply officer). Cantilever track scales for cold-storage plants are generally used only in accepting meat from the vendor. One scale on the receiving track will suffice inasmuch as the tagged weights are generally used for receiving and issue of shipments obtained through quartermaster market centers. Local purchase of meat hooks, meat track, and track scales will be made only when they are not available from unused post facilities. Meat tracks will not be used in frozen-food storage spaces; all frozen food will be piled on floor dunnage.

f. SHELVES. Shelves will not be used to conserve floor area in frozen-food and cooler storage spaces.

g. DIRECTIVES ON PERISHABLE FOOD. The following publications of the Office of The Quartermaster General and The Adjutant General pertaining to warehousing of perishable subsistence will be used as a guide: TM 10-610 and SB 10-153 and 10-187.

5.69. Gas Masks and Canisters

a. REQUISITIONS. Requisitions from class I, II, III, and IV stations for special-purpose masks and canisters for repairs and utilities purposes will be submitted to the service command engineer. Requisitions for the following masks and canisters approved by the service command engineer will be forwarded direct to the appropriate Chemical Warfare Service depot for supply. (See *b* below.) However, exceptional issues of canisters and masks will be requisitioned from the appropriate depot through the Office, Chief of Chemical Warfare Service.

Gas masks

Mask, gas, service, M2A2, acid-vapor M1—111A1

Mask, gas, diaphragm, M3A1, all-purpose M1—1VA1

Mask, gas, service M2A2, ammonia M1—111A1

Mask, gas, service, M2A2, HCN, M2—1VA1

Mask, gas, service, M2A2, oil-vapor M1—111A1

Canisters

Canister, acid-vapor, M1

Canister, all-purpose, M1

Canister, ammonia, M1

Canister, HCN, M2

Canister, oil-vapor, M1

b. DEPOTS. Service command engineers will forward approved requisitions directly to the appropriate Chemical Warfare Service depot as follows:

<i>Item</i>	<i>Supply Depot</i>
Gas masks for use in First through Sixth Service Commands or corresponding divisions.	The Commanding Officer Eastern Chemical Warfare Depot Edgewood, Maryland
Gas masks for use in the Seventh, Eighth, and Ninth Service Commands and corresponding divisions.	Chemical Warfare Supply Officer Utah ASF Depot Ogden, Utah.
Canisters for use in all service commands and divisions.	The Commanding Officer Indianapolis Chemical Warfare Depot 2060 Northwestern Avenue Indianapolis, Indiana

c. LOCAL PURCHASE. On approval by the service command engineer, special-purpose industrial masks not listed above and respirators required for repairs and utilities purposes may be purchased directly with locally available repairs and utilities funds. Such special-purpose items will be procured directly in accordance with the general schedule of supplies entitled Special Wearing Apparel (grade 37, supp. No. 5), Procurement Division, Treasury Department. Items not listed

therein may be procured directly from any source and should not be requisitioned from Chemical Warfare Service.

d. OPERATING INSTRUCTIONS. Instructions in TM 3-205, instructions on canisters, and information from the local Chemical Warfare Service officer will be observed in the use of gas masks and canisters.

5.70. Supply of Refrigerants

The service command engineer will submit (in sufficient time to be received by the 20th of the month) to OCE, Attn: SPEUF, monthly letter request for the required amount of freon-12 to be shipped the following month. Negative requests will be submitted if no shipments are required. Requests will indicate quantity and size of cylinders desired. Requests will be modified by OCE on the basis of available cylinders. OCE will request contractor to ship the approved amount of freon-12 by freight to a central destination and will advise the commanding general of the service command to issue a confirming delivery order. Posts will be supplied required amounts of freon-12 for repairs and utilities purposes by requisition from the service command stock. Government-owned freon-12 cylinders, except those which are used for service, are shipped by freight collect to Kinetic Chemicals, Incorporated, Carney's Point, New Jersey immediately after they are emptied. Freon-12 for other than repairs and utilities purposes, and other refrigerants such as ammonia, sulfur dioxide, and methyl chloride, will be procured in accordance with SB 5-49. (See par. 1.61.) Local purchase of refrigerant cylinders is not authorized.

5.71. Accountability for Government-owned Freon Gas Cylinders

Filled Government-owned freon cylinders received at a service command engineer warehouse from the manufacturer will be accounted for and picked up on the warehouse stock record. Cylinders will be shipped to individual posts on a War Department shipping document which will serve as a credit voucher to the warehouse stock account. Cylinders received by the post engineer will be picked up on the stock record cards in accordance with TM 5-601 (when published). The service command War Department shipping document

will be the debit voucher to this account. Empty cylinders will be shipped collect freight to Kinetic Chemicals, Inc., on a War Department shipping document, a copy of which will act as a credit voucher to the post engineer's stock account. Two copies of this document will be forwarded, one attached to the requisition to service command for additional refrigerant, the other to the District Engineer, U. S. Engineer Office, Military Supply Division, 1400 Penn. Mutual Building, Philadelphia, Pennsylvania, Attention of Property Officer. No attempt will be made to account for cylinders by serial number.

5.72. Supply of Mechanical Refrigerators

a. REQUISITIONS. Mechanical refrigerators required for repairs and utilities work and listed in Equipment Manual for Area and Post Engineers will be furnished to posts, camps, and stations on requisition. As the need arises, requisitions for initial requirements will be forwarded through appropriate service command channels in accordance with existing regulations. Initial requirements or complete replacements for AAF control depots will be furnished without reimbursement.

b. INFORMATION REQUIRED. Requisitions for refrigerators purchased centrally will include the following:

(1) For refrigerators to supplement existing capacity in mess halls for warehouses:

(a) Number of persons being served.

(b) Type and plan number of building containing the facility.

(c) Cubic contents of existing refrigerated space.

(d) Additional refrigerated space required.

(2) For frozen-food refrigerators (10° F.) in hospital, consolidated mess, or warehouse:

(a) Name and location of market center which serves post.

(b) Distance from market center to post.

(c) Present schedule of deliveries from market centers.

(d) Items of subsistence delivered frozen.

(e) Time between delivery from market and issue.

(f) Frozen-food storage space (10° F.) now available.

(g) Approval of service command or air force quartermaster or supply officer.

5.73. Manufacturing Plants

Responsibilities for operating refrigeration and ice plants at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds are as indicated below: OS denotes operating service and RU denotes repairs and utilities. For a list of facilities to which this policy applies, see paragraph 1.9.

<i>Operation</i>	<i>Responsibility</i>
Industrial refrigeration*	OS
General post-use plants	RU
Sale of ice	OS
Nonindustrial refrigeration ..	RU
Compressed-air system	OS

* Refrigeration engineers in OCE and service command engineers in each service command are available to assist in problems of operation and maintenance.

Section VI. WATER AND SEWAGE

5.74. Water Services

Policy for water services is contained in AR 100-90.

5.75. Sale of Water Service

AR 100-90 governs the sale of surplus water, including sale to Government-owned civilian war-housing projects located outside military reservations.

5.76. Sale of Sewage Disposal Service

a. PERMISSION TO SELL. Army sale of sewage disposal services during the national emergency is approved where:

(1) Sewage treatment is essential to health at the post or in surrounding areas affecting health at the post.

(2) Surplus sewage treatment capacity exceeds any known future needs of the post and sale conserves critical labor and materials.

(3) The best interests of the United States are served.

b. CONTRACTS OR PERMITS. Sale of sewage disposal service may be either by *contract* or *permit*. The service command engineer has authority to furnish such services by contract if granting rights to enter Government real property or easements over real property are not necessary. If granting right to enter, construct, and maintain a connecting sewer or appurtenances on Government property is required, the Secretary of War can grant a permit in which terms of sale of sewage disposal may be incorporated. (See AR 100-62.) All contracts or permits will contain necessary provisions safeguarding the Government's interests, including a terminating clause with ample notice of termination.

5.77. Manufacturing Plants

Responsibilities for water supply and sewage functions for industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds are indicated below; OS denotes operating service and RU denotes repairs and utilities. For a list of facilities to which this policy applies, see paragraph 1.9.

a. WATER SUPPLY.

<i>Operation</i>	<i>Responsibility</i>
Purchase of water:	
Industrial	OS
Building and grounds (by reimbursement)	RU
Operation of water treatment plant	OS
Operation of water-pumping plant	OS
Maintenance of distribution system:	
Outside buildings	RU
Inside buildings:	
Industrial use	OS
Sprinkler use	OS
Health, sanitation, cleaning, washing, drinking, and sewerage use (by reimbursement)	RU
Contract:	
Provisions and execution...	OS
Review and approval.....	OS & RU

b. SEWERAGE.

<i>Operation</i>	<i>Responsibility</i>
Purchase of service	RU
Operation of sewage-treatment plant	RU
Operation of sewage-pumping plant	RU
Maintenance of collection system:	
Outside buildings	RU
Inside buildings:	
Industrial waste if separate treatment plant required	OS
Sanitation waste and industrial if no separate plant required	RU

c. STORM-WATER DRAINAGE.

<i>Operation</i>	<i>Responsibility</i>
Operation of drainage pumps.	RU
Maintenance of entire system.	RU

d. HIGH-PRESSURE WATER SYSTEM

OPERATION	OS
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Note. Sanitary engineers are available in OCE and in the service command engineer's office for technical assistance on problems concerning the above.

5.78. Water Conservation

a. MEASURES. Positive action will be taken to eliminate water waste and to reduce per capita consumption. It is not the policy of the War Department to prohibit the use of water for irrigation of lawns and similar areas where water is available. Waste of water through faulty irrigation is prohibited. The use of water in swimming pools will be coordinated with the post surgeon in order that water will not be wasted by improper operation of flowing-through and fill-and-draw swimming pools. Treated water will not be used for sewer flushing except where absolutely necessary to proper maintenance and operation of the sewerage system.

b. URINAL FLUSH VALVES. Self-closing flush valves will be installed on urinal troughs equipped with perforated flush pipes. Steps will be taken to eliminate excessive consumption by other type urinals.

5.79. Water Metering

A master meter will be installed for each source of water supply. Supply from several sources, such as several deep wells or separate points of purchase, will be metered at each source.

5.80. Water-level Gauges for Wells

Drawdown or water-level testing gauges will be installed in all active deep wells to provide daily operating data essential for further development of underground water supplies and for pumping schedules.

5.81. Water Mains

Water mains will not be installed to provide fire protection in ammunition storage areas unless the Chief of Ordnance rules that special conditions make their installation necessary.

5.82. Swimming Pools

a. OPERATION. All swimming pools, reservoirs, or tanks used for swimming, whether constructed with appropriated or nonappropriated funds, will be operated in accordance with TB MED 163. Approval will be secured from the commanding general of the service command in accordance with AR 100-90 and will depend on availability of water supply, conformance to sound sanitation,

and reasonable operating costs. Repairs and utilities funds can be used to purchase operating supplies such as water chemical and chlorine when the United States has title to the pool, tank, or reservoir and operation has been approved by the commanding general of the service command. Subject to provisions of the lease, leased pools are considered to be under War Department control, vesting the Government with a real property interest justifying use of repairs and utilities funds for operation.

b. CONSTRUCTION. No new swimming pools, reservoirs, or tanks of any type to be used for swimming will be constructed with appropriated funds without the approval of the Chief of Staff. Swimming pools, reservoirs, or tanks to be constructed with nonappropriated funds will be approved in accordance with paragraph 1.20. The following additional factors will also be considered:

(1) Duration of activation of the post, camp, or station.

(2) Construction design, which must conform to sound sanitary practices.

(3) Minimum use of critical materials.

(4) Reasonable construction cost.

(5) Conformance to War Department construction policy and provisions of paragraph 2.1b.

c. REPAIRS. Appropriated funds for repairs and utilities work on Government-owned pools, reservoirs, or tanks for swimming will be spent in accordance with AR 100-80 and WD Circular 388, 1944. Nonappropriated funds for maintenance and repair on pools, reservoirs, or tanks for swimming will be spent in accordance with paragraph 1.20.

5.83. Chlorination of Water

a. CHLORINE RESIDUAL. A chlorine residual of at least 0.4 ppm after a 30-minute-contact period in the system or in a closed sample bottle will be maintained at all times in those parts of the potable-water distribution system under constant circulation. This does *not* apply to water directly supplied to posts, depots, leased buildings, and similar facilities by a satisfactory, chlorinated, public water supply distribution system. It *does* apply to—

(1) Army-owned and operated well and surface supplies.

(2) Nonchlorinated water from municipal or privately-owned sources.

(3) Chlorinated water from municipal or privately-owned systems where sanitary, physical, or operating defects or other special hazards are known to exist or where bacteriological examinations show that satisfactory quality cannot be obtained without rechlorination by the post.

b. EXCEPTIONS. The foregoing is not mandatory if—

(1) Following chlorination, the water is stored for long periods in properly protected distribution reservoirs.

(2) Iron, manganese, or other chlorine-consuming compounds make it impractical to maintain a chlorine residual of 0.4 ppm. In such cases additional treatment may be required to produce water of acceptable bacteriological quality.

c. USE OF AMMONIA. If use of chlorine alone results in objectionable tastes and odors due to foreign matter or to the chlorine itself, ammonia may be used with the chlorine. This use will be restricted to locations where the tastes and odors are highly objectionable.

5.84. Chlorination of Sewage

Except in emergencies or where required for satisfactory sanitation within a military reservation, specific approval by service command will be required for chlorination of sewage plant effluents. Approval will be recommended only where chlorination is clearly needed to protect public health or, in limited instances, where required to control nuisance conditions.

5.85. Liquid Chlorine

a. SUPPLY OF CHLORINE CYLINDERS. Service commands will maintain a limited stock of Government-owned chlorine cylinders (generally 150-pound capacity) for emergency transfer to installations at which service command has repairs and utilities supply responsibility. Each such installation will be assigned cylinders on the basis of normal chlorine consumption, number of chlorinators, and shipping time for refilling. Additional cylinders for changed requirements and emergencies will be requisitioned from the service command engineer. Cylinders excess to an installation will be transferred to the service command

engineer. Accountability of chlorine cylinders will be by size only and not by serial number. Serial numbers will not be listed on bills of lading, purchase or delivery orders. Except in emergencies, requisitions for chlorine cylinders for facilities exempted from service command repairs and utilities supply responsibility will be forwarded by the service command to OCE for approval.

b. CONTRACTS FOR PROCUREMENT OF CHLORINE. Service commands will maintain indefinite quantity contracts for refill of Government-owned chlorine cylinders effective on issuance of purchase orders by installations. Liquid chlorine for refilling Government-owned cylinders assigned for repairs and utilities purposes will be procured only under such contracts. Such contracts will obligate the contractor to inspect and test cylinders as required by I.C.C. regulations, inspect and service valves, repaint cylinders as necessary for proper protection, be responsible for cylinders consigned to him until delivered to common carrier for return, and render monthly report to the service command showing for each installation—

(1) Cylinders consigned to him as shown by B/L.

(2) Cylinders received.

(3) Cylinders delivered to common carrier for return to installation.

(4) Weight of chlorine sold.

Shipment of empty and full chlorine cylinders will be made on Government B/L issued by the installation.

c. STOCK OF CYLINDERS AND PARTS. Service commands are authorized to loan a limited supply of cylinders and spare valves to contractors to eliminate delay in servicing and maintaining cylinders and to make up for cylinders delayed in transit.

d. PROCUREMENT OF CHLORINE. Individual service commands are responsible for contracts for procuring chlorine in Government-owned cylinders for water and sewage treatment at Army posts. To eliminate delays in filling purchase orders, service commands may furnish to their contractors a small revolving stock of Government-owned cylinders. Arrangements should be made with the contractor to provide a monthly status report on this revolving stock of cylinders. If received from a post, commercial cylinders will

be returned to owners by the contractor; they will not be filled under service command contract. Chlorine cylinder serial numbers will not be listed on bills of lading, purchase or delivery orders. Accountability will be by cylinder size and quantity only, not by serial number.

5.86. Calcium Hypochlorite

a. SUPPLY. Stocks of Grade AA calcium hypochlorite in 5-pound resealable cans will be maintained in engineer depots and engineer sections of ASF depots. Requisitions for calcium hypochlorite for repairs and utilities purposes will be sent for approval to the service command. Requisitions will be filled from existing stocks of Grade A in service command warehouses until such stocks are exhausted. Thereafter, the service command will forward requisitions to the proper distribution depot.

b. USE. All restrictions on the use of high-test calcium hypochlorite in favor of sodium hypochlorite are withdrawn.

5.87. Submission of Water Samples for Chemical Analyses

When field analyses are impractical, complete chemical analyses of post water supply may be obtained by submitting samples to the Geological Survey. The Water Resources Branch, U. S. Geological Survey, Washington, D. C., will supply sample bottles, shipping containers, and instructions on request. Whenever possible, field tests for pH and dissolved oxygen and carbon dioxide should be made when samples are taken, and the data obtained sent with the samples to the Geological Survey.

5.88. Scale and Corrosion in Potable-water Supply Systems

Threshold conditioning will be used to control scale and/or corrosion in potable-water supplies, particularly in hot-water systems, in accordance with established procedures. Technical problems which arise will be referred to the service command engineer who has competent personnel available to recommend methods of treatment and chemicals to be used. Contracts for potable-water treatment by private industrial or commercial firms are not authorized.

5.89. Safeguarding Port Water Supplies

The following precautions for reducing health hazards through pollution of drinking-water sources will apply to all War Department installations at pier, warehouse, and dock facilities, and to vessels moored to waterfront facilities under War Department jurisdiction.

a. AT PIERS. No cross connections, siamese or others, will exist between shore drinking-water supply and nonpotable-water supply systems for fire fighting or other purposes.

b. VESSELS WITH POWER. No cross connections will exist between shore drinking-water supply and nonpotable- or unsafe-water supply systems on vessels moored to waterfront facilities when such vessels have power to operate fire or other pumps.

c. VESSELS WITHOUT POWER. Whenever a vessel moored to a waterfront facility is without power to operate its fire pumps, a water supply for fire protection will be made immediately available by taking the following measures:

(1) Water from the shore drinking-water system may be brought aboard for fire protection by separate hose lines or other means, provided there is no connection between the shore drinking-water system and any other water source.

(2) If the vessel has no power to operate its pumps, a connection from the shore drinking-water system to the vessel's fire and sanitary-flushing systems may be made with a fixed pipe or hose line, provided that satisfactory backflow prevention devices are installed between the vessel and shore systems at individual outlets and that such installations meet the minimum requirements of local health codes or regulations or of agreements made with local health authorities for this specific wartime use.

(3) If the connections described in (2) above, are not feasible, hose lines may be led aboard and necessary adapters and fittings furnished for making a physical connection between the shore drinking-water system and the vessel's fire system. However, no actual connection will be made for fire fighting until an alarm is sounded. A man on watch will be assigned to complete all connections and open necessary valves when the alarm sounds. He will break the connections as soon as the alarm ends. He will be responsible for notifying the local health officer and local

water superintendent when such connection is made.

(4) If water for sanitary fixtures cannot be provided as in (2) above, portable gasoline-engine or motor-driven pumping units may be used for this purpose if no cross connection is made with the vessel's potable-water supply.

(5) The connections described in (1) or (2) above, either with or without approved backflow prevention devices, will not be made while any other connection to an outside nonpotable- or unsafe-water supply exists or after the vessel's pumps are in operation.

(6) These requirements will not be construed to conflict with Coast Guard Regulations concerning Security of Vessels in Port.

5.90. Operation of Water Supply Systems for Fire Protection

Proper and effective operation of the water supply and distribution systems is necessary to the effectiveness of the fire prevention program.

a. ORGANIZATION. Responsibility for operation and maintenance of water supply facilities and distribution system will be vested in one person who has ultimate knowledge of all details of the facilities and distribution system. Full coordination will be effected between fire fighting and water supply sections. Duties of water supply personnel in pump operation and distribution system control during fire calls will be clearly defined.

b. INFORMATION. Distribution system and valve location maps must be complete. Each key employee responsible for maintenance and control of the distribution system will have copies of sectional maps and valve locations with him while on duty. Complete pumping station data will be posted for operating reference. Personnel responsible for operation of water supply equipment will have adequate knowledge of—

(1) *The physical plant* including characteristics, location, operation, maintenance and current inspection status of pumps, motors, engines, indicating devices, controls, valving, water sources, standpipes, reservoirs, distribution systems, fire hydrants, and connections.

(2) Fire-flow requirements upon water supply system, alternate and emergency methods of effecting such supply, and result of operation or failure of each unit of equipment upon other components of the system.

5.91. Water Softeners for Laundry Operation

The furnishing of supplies, including the purchase of salt, necessary for the operation of water softeners in laundries is a part of the post engineers' responsibility for furnishing a water supply suitable for laundry purposes. This responsibility remains the same whether the water softener is installed in the boiler room or in the laundry building.

Section VII. UTILITIES CONTRACTS

5.92. Responsibility

Commanding generals of service commands, air forces, or AAF commands are responsible for furnishing utilities services to posts, camps, and stations in the United States, except as prescribed in AR 100-80. Post engineers, as staff officers, are responsible for utilities services to posts.

5.93. Functions of Service Command Engineers

a. To readjust utility contracts in the Government's favor at service command installations, the service command engineer will—

(1) Advise area and district engineers in negotiating rates for new contracts.

(2) Review and, if necessary, readjust rates of service command contracts for repairs and utilities purposes at posts, camps, manufacturing plants, and other military installations.

(3) Periodically survey load characteristics affecting rates at posts, camps, manufacturing plants, and other military installations under service command jurisdiction to determine need for further rate adjustment.

(4) Furnish the service command legal staff with engineering data necessary to prepare, execute, or revise utility contracts.

(5) Maintain liaison with State and municipal bodies regulating utilities.

b. AT OTHER INSTALLATIONS. Installations not under the service command for repairs and utilities purposes can request the assistance of the service command engineer for the services in *a* above.

5.94. War Department Power Procurement Officer

a. OCE RESPONSIBILITY. A War Department Power Procurement Officer located within OCE is designated in paragraph 394.2, WD Procurement Regulations. For contracts of 1,000 kilowatts or over where the War Department has interest in cost, the War Department Power Procurement Officer is responsible for—

(1) Reviewing contracts and initiating modifications or changes necessary to comply with the President's directives.

(2) Reviewing proposed contracts and supplements to existing contracts which extend time, alter contract price, or make substantial change in terms, to assure compliance with the President's directives.

b. REPRESENTATIVES OF POWER PROCUREMENT OFFICER. Repairs and utilities divisions of offices of service command engineers will represent the War Department Power Procurement Officer, and under his direction will carry out necessary field activities concerning contracts and supplements thereto for electrical service of 1,000 kilowatts or over to all establishments within the geographical boundaries of the service commands, if the War Department has an interest in the cost of such service. Commanding officers at such establishments will assist these representatives by furnishing all information required.

5.95. Form of Contracts

Utility contracts will adhere as closely as possible to WD Contract Form 15, War Department Negotiated Electric Service Contract (Connection Charge) and WD Contract Form 27, Negotiated Utility Service Contract (No Connection Charge—Electric, Gas, Water, Sewage Service) with modifications suggested herein. These forms are set forth in WD Procurement Regulation 13.

5.96. Term of Contract

Utility contracts should continue until further notice, although whenever possible the Government will ask the right to cancel within 30 days. However, if a longer cancellation period is needed to obtain a more favorable rate, contracts may be drawn with a maximum cancellation period of 90 days or with minimum charges continuing until the end of the contract year.

5.97. Applicable Rates

Army installations having load characteristics comparable to industrial and municipal loads will, whenever possible, be served at the lowest industrial, municipal wholesale, or comparable Government service rate. When a rate is made part of a contract, all provisions of the rate which may

effect the cost of service to the Government will be included.

5.98. Connection Charges

a. PAYMENT. Connection charges will be paid by the Government only for temporary Army installations, and when the connections built will not usefully serve other loads after Army use is discontinued.

b. REFUND OF CONNECTION CHARGES. Net cost to the Government of connecting facilities less estimated salvage value will, whenever possible, be refunded from monthly payments for service within 5 years. The percentage of monthly bills so refunded should be as high as load conditions warrant and never less than 10 percent, without prior approval of OCE.

c. ACCOUNTING FOR COLLECTIONS. Deductions from current bills for services consumed are in the nature of repayment of the *advance* to the utilities company. As such, these monthly recoveries are considered to be expenditure refunds and will be accounted for in accordance with TM 14-702. The gross amounts of current bills for utilities consumed under the contract should be charged to the applicable operating allotment and the amount of the collection credited to the expenditure refund account of the applicable appropriation as shown in TM 14-700, irrespective of whether the allotment to which the cost of construction was charged has been closed or is still available for expenditures and/or collections. The gross amount of the utility bill will be posted to the cost account applicable to the purchased utility services.

5.99. Prompt-payment Discounts

Prompt-payment discount periods or penalty provisions for delayed payments will allow the Government time to pay bills without penalty or loss of discount. Whenever possible such periods will not be less than 30 days.

5.100. Combined Loads and Meter Readings

Whenever practicable, loads will be combined in order to obtain the lowest cost of utility service, due consideration being given to the critical materials required. Cost of combining loads at temporary Army installations will not exceed esti-

mated savings for a 3-year period. When combined meter readings can be billed as one quantity at the same rate as for combined loads, the methods requiring least use of critical materials will be employed.

5.101. Meter Testing and Refunds

Contract provisions concerning meter testing and refunds for inaccurate meters will conform as closely as practicable to regulations of the State or local body having jurisdiction.

5.102. Primary Electric Service or Metering Discounts

When electric service at Army installations is furnished and billed at secondary voltage but metered at primary voltage, the contract will provide an equitable discount to reimburse the Government for transformer losses. When electric service is furnished and metered at primary voltage but billed at secondary rate, the contract will provide an equitable discount for both transformer losses and Government ownership of transformers.

5.103. Procedure

Post engineers, acting for post commanders, will notify commanding generals of service commands of rates, rules, and contract provisions which cannot be adjusted by mutual agreement between contracting officers and contractors. Service command engineers, acting for commanding generals of service commands, will help post engineers get necessary rate adjustments. If adjustments cannot be obtained by mutual agreement between service command engineers and contractors, service command engineers will appeal to the appropriate State or local regulatory bodies having jurisdiction over the rates and rules of the contractors. When service command engineers feel that agreements satisfactory to the Government have not been obtained, they will make factual reports for commanding generals of service commands to the Chief of Engineers or the War Department Power Procurement Officer, whoever has approval authority.

5.104. Sale of Surplus Utilities Services

For policy on the sale of surplus utilities services, see AR 100-90.

Section VIII. PERMANENTLY INSTALLED PETROLEUM PRODUCTS STORAGE AND DISTRIBUTION SYSTEMS

5.105. Responsibilities

a. MAINTENANCE, REPAIR, OPERATION, AND INSPECTION. Maintenance, repair, operation, and inspection of permanently installed petroleum products storage and dispensing systems at class I, II, III, and IV installations are classified as repairs and utilities functions within the scope of AR 100-80. Commanding generals of air forces or air force commands are responsible for supervision of maintenance and repair at class III stations. Commanding generals of service commands are responsible for supervision of maintenance and repair at class I, II, and IV stations. The using service is responsible for operation. Items of maintenance closely allied to the operation of the systems will be accomplished by operating personnel in accordance with existing regulations and directives. Specific items of maintenance required of operating personnel will be determined by local conditions and assigned by installation commanders.

b. PREVENTIVE MAINTENANCE. The care and preservation of permanently installed gasoline and fuel oil storage and dispensing systems through preventive maintenance practices at class I, II, III, and IV installations is a repairs and utilities responsibility. The inspection of these systems will be performed in accordance with existing directives and TM 5-679 (when published). Installation commanders will be responsible that post engineers perform adequate, periodic inspections to insure proper operation, the installation of the necessary safety devices and equipment, and that proper care and precautions are taken to eliminate fire and explosion hazards and the danger of contamination.

c. OTHER RESPONSIBILITIES FOR AIRPORT SYSTEMS. AAF and CE are jointly responsible for development, design, and research for permanently installed distribution systems on airports. QMC is responsible for development liaison. CE is responsible for procurement, storage, and issue. AAF is responsible for installation with the exception that CE is delegated to perform this function in the zone of interior except for Govern-

ment-owned aircraft assembly plants and modification centers.

d. OTHER RESPONSIBILITIES FOR SERVICE STATION TYPE EQUIPMENT. Except for troop issue or those peculiar to AAF, CE is responsible for the development, design, and research of service station type pumping equipment. CE and QMC are jointly responsible for development liaison. CE is responsible for procurement, storage, issue, and installation. Service station pumps, hose, and nozzles will be purchased locally.

e. SUPPLY OF LIQUID FUEL AND OPERATION OF SYSTEMS. The supply of liquid fuels (other than heating fuels) or the operation of installed liquid fuel systems is not a repairs and utilities function. Liquid fuel is usually delivered to installations by railroad tank car, commercial or Government tank, truck or, at some locations, through pipelines from railheads or barge terminals. Method of delivery is determined by location and available facilities and is a responsibility of the supply service. The provision of facilities for the unloading of tank cars or trucks and the maintenance of these facilities and supply lines is a repairs and utilities function.

5.106. Hazards

The storage and handling of gasoline and other aromatic fuels present certain hazards, principally because of the nature of these substances when in vapor form. Critical situations may arise if there are inherent deficiencies in fuel dispensing systems through faulty design or installation, or if proper methods of operation or maintenance are not followed. Operation and maintenance will be such as to insure maximum safety for operating personnel, fuel, and equipment, and delivery of clean, dry fuel, free from contamination or dilution of one grade or type of fuel with another.

5.107. Conservation

In the interest of conservation of fuel, the following practices will be followed:

a. Accurate gauging of receiving tanks for

available capacity before beginning delivery and regauging before tanks have been filled to capacity.

b. Inspection of discharge from hydraulic system as receiving tank approaches capacity.

c. Following specified procedures in making connection to tank cars and trucks.

d. Care in filling operations to avoid spillage or overfilling of fuel tanks.

e. Immediate repair of leaks at pumps, fill stands, and other equipment.

f. Observance of precautions against starting of fires and subsequent loss of fuel.

5.108. Repair and Alteration

Repair, replacement of equipment, or alterations to the system will be performed by, or under the supervision of, skilled personnel available to the post engineer. Repairs and alterations will be coordinated with operating personnel prior to initiation of the work.

5.109. Personnel

Personnel assigned for operation, maintenance, repair, or inspection of these systems will be qualified for such assignment by previous experience or instruction and will be familiar with AR 850-20 and TM 5-678 and TM 5-679 (when published).

5.110. Design

To eliminate defects of design or construction, the following standards will be adhered to:

a. ACCESS. Easy access will be provided to all pits and pump houses. Covers not affording free and easy access will be altered or replaced.

b. VENTS. Adequate ventilation must be provided at all times for pump houses and large pits to prevent the accumulation of explosive mixtures of gasoline vapor. Small pits, hand holes, and pits normally used for maintenance purposes only may be considered sufficiently ventilated by removal of covers. Pump houses and deep pits requiring the entrance of personnel for operation or inspection will be provided with positive means for dissipation of hazardous gases. Louvers at ceiling and floor line are sufficient for above-ground installations. Intakes of ducts are placed near the floor line. All storage tanks except those used in

hydraulic displacement systems will be vented. Vents of underground tanks will be equipped with weather caps and screens; vents of above-ground tanks will be equipped with pressure and vacuum relief valves to hold pressures within the tanks to safe limits. Vent lines will be pitched downward toward tanks and will not be manifolded. Vent lines from self-priming centrifugal pumps installed in pits will be extended outside of pits. The discharge opening of vent lines from tanks or pumps will be not less than 10 feet above ground and not less than 20 feet horizontally from the opening of any pit which a man can enter unless the surrounding terrain or construction will prevent the flow of gases into the pit.

c. DRAINAGE. Clean, dry pits are essential for efficient operation and maintenance to prevent excessive deterioration of equipment. Where water from seepage, flooding, or other causes is encountered in large pits, drainage by gravity or by use of sump pumps may be provided. Hand pumps will be used to remove water from small pits. Drains from pits into any main drainage system will be provided with water seal traps, properly vented, to prevent the flow of gases into the main drainage system. (Discharge lines from water control pits of hydraulic systems may be excepted from this provision unless local conditions indicate the need for this precaution.) If aviation fuel is carried over or is spilled in the main drainage system of the installation, the responsible authority will be notified immediately, and it is incumbent upon this authority to take the necessary action to flush thoroughly the affected drainage and to take other necessary action to prevent damage to property or personnel from fire or other hazards.

d. FUEL LINES. In order to relieve the expansion pressure of delivery and supply lines which are long, of large capacity, or exposed to excessive changes of temperature, a short bypass line equipped with a pressure relief valve will be provided across shut-off and check valves of these lines. Manually-operated valves will not be incorporated into bypass lines. No manifold valve will be bypassed into its manifold, nor will bypass lines be manifolded. Adequate strainers will be provided on all truck fill stands and in lines used for unloading tank cars, barges, or trucks into fuel storage systems. Where flow of fuel will

occur when a cover is removed from a strainer, shut-off valves will be provided in the line on both sides of the strainer. Valves installed underground will be readily accessible for operation, maintenance, and repair.

e. PUMPS AND MOTORS. To prevent overheating, deep-well type pumps will be equipped with a bypass line of sufficient size to provide a discharge back to the tank of 2 percent of the maximum capacity of the pump. This bypass line will be installed in the discharge line at a point between the pump discharge and the check or shut-off valve. No valve will be provided in this bypass line. Transfer pumps used to deliver fuel to hydraulic storage systems will be equipped with approved air eliminators. Pumps and adjacent above-ground lines will be provided with sun shades or other cover to reduce the probability of vapor lock during warm weather. Internal combustion engines used for driving fuel pumps, when beyond economical repair will be replaced with explosionproof electrical motors if electrical power is available and the installation can be made at a reasonable cost.

f. INSTALLATION OF GASOLINE METERS. Gasoline meters are not required on AAF truck-fill stands because AAF fueling trucks and permanently installed fuel pits have meters.

g. GROUNDS AND ELECTRICAL CONNECTIONS. Railroad sidings used for delivery of aviation fuel must be insulated from the main lines, grounded, and electrically bonded to the pipe lines of the fuel storage system. Suitable grounds and grounding conductors will be provided throughout the system. If pilot lights are required on mechanical systems, such lights need not be located at fill stands or points of delivery but must be readily visible to the operator on duty. All electrical work in the storage area will comply with the requirements of the National Electrical Code for Class I, Group D hazardous locations. Inferior or temporary work will not be permitted.

h. ACCESS ROADS. Adequate access roads will be provided for unloading trucks at railroad-fill connections. Necessary adapter fittings, screens, and grounding cables for trucks will be installed.

5.111. Maintenance

Maintenance of petroleum products storage and dispensing systems will be in accordance with TM

5-679 (when published) and will include the following:

a. FUEL LINES. To prevent admixture of fuel, manifold valves will be checked frequently for leaks. Lines will be clearly and positively identified by permanent markings. The permanent markings will consist of painting the lines for lengths of 1 foot at the entrances to the valves and stenciling thereon in contrasting color the grade of fuel carried in the line. The color of the paint for the lines will be in conformity with the color system used at the base. Sections of a fueling system not required for fueling operations will be isolated from the active portion of the system.

b. TANKS. Tanks will be checked for water seepage. Where water seepage is evident, manholes and other tank openings will be inspected for possible faults. Automatic low-level shut-off devices will be checked and kept in good operating condition. Liquid level gauges may be removed when their repair becomes too burdensome. Water detector locks which cannot be kept in operating condition with reasonable maintenance and repair may be removed from the system. However, in such cases special care must be exercised in gauging or testing to determine the presence of water. Other automatic gauges necessary for the operation of the systems will be recalibrated, repaired, or replaced.

c. INACTIVE INSTALLATIONS. Permanently installed petroleum products storage and dispensing systems at inactive installations and sections of such systems not being used in current operations at active installations will be protected by suitable precautions to prevent rapid deterioration and to maintain the system in such a manner that it may be restored to active use without excessive delay and expense. Standards prescribed in TB ENG 66 for minimum maintenance of inactive gasoline storage and distribution systems will be carefully adhered to. In those cases, however, where past experience has indicated that the unused sections may not be used in the future or where there is no foreseeable need for the unused sections, all equipment that may readily be removed from these sections should be removed, cleaned, prepared for storage, and stored where such equipment will be available for reissue or reinstallation should such need arise.

5.112. Operation

To eliminate deficiencies in operation of these systems, the following additional precautions will be strictly adhered to:

a. Tanks will be periodically tested to determine the quantity of sludge deposit and for the presence of water. Tanks will be cleaned in accordance with existing safety regulations before sludge deposits are sufficient to become a hazard to the operation of the system. Excessive quantities of water will be removed from the system.

b. When a change is made in grade of the same type of fuel stored in the tank, cleaning of the tank is not required but every reasonable effort will be made to remove all the old liquid fuel from the tank. Exceptional vigilance must be exercised to prevent contamination of gasoline type fuel with JP-1 fuel.

c. Trucks will not be unloaded through clean-out pipes directly into the storage tanks, nor will they be unloaded within 25 feet of any pit or tank vent.

d. The use of a single piping system to handle more than one grade of fuel will not be permitted unless extreme care is used to drain the piping system completely each time a different grade of fuel is handled, or, in the case of long-fill lines, suitable approved procedures, specifically developed for each installation, are followed. A manifold line, properly valved to prevent admixture of fuel, may be used for tank car unloading of different grades of the same type of fuel if the manifold is drained after use. When a single pump is used for unloading various grades of the same type of aviation fuel, fill lines may be manifolded if valved at the pump in such a manner that only the fuel in a short section of the fill line and the pump casing will be mixed.

5.113. JP-1 Fuel

Existing hydraulic displacement or mechanical systems designed for storage and distribution of gasoline type fuels may be used for storage and distribution of JP-1 type fuel for jet-propelled aircraft. Existing pumps, strainers, water separators, and similar equipment may be used after being thoroughly cleaned, but no fuel will be dispensed from these systems to jet-propelled aircraft except by fueling trucks that have been

equipped with strainers especially approved for JP-1 fuel. No change in lubricant for valves or other equipment in contact with the fuel will be required. The following precautions will be observed in preparation of existing storage for storage of JP-1 fuel:

a. Those parts of existing systems to be used for jet fuel storage will be completely isolated from other fuel storage. Valves will not be relied on for separation of pipe lines. *Isolation will be accompanied by the use of blank flanges or by removal of pipe sections.*

b. Tanks and pipelines will be completely drained of all old fuel and examined for cleanliness. If visual examination reveals the presence of excessive rust, scale, or sludge, these deposits will be removed by the most economical and efficient method.

c. Air and water eliminators or segregators will be tested for proper operation after floats have been rebalanced for the higher gravity fuel.

d. Hydraulic displacement system tanks, including water trap tanks, will be drained and flushed. Floats of controls and gauges will be adjusted for proper operation in the higher gravity fuel and controls tested and adjusted in accordance with the recommendations of the manufacturer. Defective float operated valves will be repaired or replaced.

5.114. New Work and New Construction

In cases where the inspection of a petroleum products storage and distribution system reveals minor defects in design or construction resulting in excessive hazards or possibility of contamination, installation commanders will take necessary action in accordance with established repairs and utilities procedures to correct these defects wherever the fuel system is expected to remain in active use. Where major defects in design or construction are evident, a thorough study of the system will be made by qualified personnel and a project for remedying the defects will be submitted through normal channels for the consideration of higher authority in accordance with existing instructions as contained in AR 100-80. Requirements for additional storage facilities, involving new construction, will be processed in accordance with AR 100-70.

5.115. Entrance to Tanks

No man will enter a tank which has contained gasoline unless he wears the prescribed protective equipment. Many tank-cleaning accidents will be prevented if each service command complies with the following safety rules:

a. Centrally store one complete set of tank-cleaning equipment prescribed in the American Petroleum Institute Manual, Cleaning Petroleum Storage Tanks, Section B—Gasoline Tanks, March 1942 (available from API, 50 West 50th Street, New York, New York). Tanks should be cleaned in accordance with this manual.

b. Designate chief of the service command gasoline-system maintenance unit as authority man for tank cleaning. He will appoint a substitute authority man to act in his absence.

c. Allow no gasoline tank to be entered without the authority man's approval.

d. Authority men receiving requests to enter a gasoline tank will—

(1) Determine necessity for entering.

(2) Request services of a safety engineer from the nearest division office of the Ethyl Corporation. These engineers will serve in an advisory capacity, and will be sent free to any location in continental United States. Except in emergencies, the Ethyl Corporation will be notified 1 week in advance.

(3) Ship complete tank-cleaning equipment and instructions to the location.

(4) Inform post engineer when tank will be entered and when Ethyl Corporation safety engineer will be present.

CHAPTER 6

FIRE PROTECTION AND PREVENTION

	<i>Paragraphs</i>	<i>Page</i>
SECTION I. Introduction	6.1-6.3	142
II. Responsibilities and functions	6.4-6.14	143
III. Personnel	6.15-6.24	145
IV. Funds	6.25-6.28	147
V. Equipment	6.29-6.44	149
VI. Fire stations	6.45-6.49	153
VII. Installed fire-protection systems	6.50-6.61	154
VIII. Operations	6.62-6.71	157
IX. Fire protection for special facilities	6.72-6.83	161
X. Cooperation with other responsible services	6.84-6.86	166

CHAPTER 6

FIRE PROTECTION AND PREVENTION

Section I. INTRODUCTION

6.1. War Department Fire-protection Program

The War Department fire-protection program consists of four phases:

a. DESIGN. Features and devices which decrease fire hazards will be designed as a structural part of buildings or projects.

b. CONSTRUCTION. The designed fire-protection features will be built into the structures.

c. FIRE PREVENTION. Defects in existing structures will be found and corrected. Adequate safeguards will be employed in storing and handling materials and equipment. Sound housekeeping practices will be established and maintained.

d. FIRE FIGHTING. Facilities and methods will be provided and used to control and extinguish fires with minimum damage to life, property, and the military program.

6.2. Adjustments in Program

The degree of fire protection at War Department installations may be adjusted by criteria developed by the War Department or by the subordinate agency having responsibility. Adjustments ordered in over-all protection will be made promptly. The War Department will accept additional risks resulting from such adjustments involving reductions brought about by War Department directives.

6.3. Aircraft Crash Rescue and Crash Fire Fighting

As used in the manual, *fire protection and fire prevention* does not include aircraft crash rescue and crash fire fighting. These activities are not included in repairs and utilities functions as defined in AR 100-80. Aircraft crash rescue and crash fire fighting are functional responsibilities of AAF at *all* War Department installations.

Section II. RESPONSIBILITIES AND FUNCTIONS

6.4. Chief of Engineers

a. STAFF SUPERVISION FOR ASF. The Chief of Engineers will carry out the following responsibilities of the Commanding General, ASF:

(1) Staff supervision for fire prevention and protection at new construction projects performed under OCE supervision and at all class I, II, IV, and special installations, except those named in paragraphs 6.6 and 6.7.

(2) Preparing uniform technical policies, procedures, and standards for Army-wide application, and inspecting all class III installations for compliance with War Department policies.

(3) Recommending to the War Department construction policy on fire prevention and protection, procurement of fire-protection equipment, and necessary incidental coordination measures.

(4) Coordination of all phases of fire protection and prevention within ASF.

b. SUPERVISION OF INSTALLATIONS UNDER SERVICE COMMAND. At military posts where commanding generals of service commands are responsible for fire prevention and protection, the Chief of Engineers will supervise the following:

(1) Determining degree of fire-protection features incorporated in site planning, structural design, and installed equipment, including installed fire-protection systems.

(2) Determining criteria for organizing fire-protection forces and distributing fire-fighting equipment.

(3) Developing standards for all installed and movable fire-protection equipment.

(4) Budgeting equipment and operating funds.

(5) Establishing fire-prevention regulations.

(6) Supervising organization, personnel, equipment, training, operations, inspections, and maintenance needed to control and extinguish fires.

(7) Enforcing fire-prevention regulations and promoting fire-prevention educational programs.

(8) Keeping fire-loss experience statistics.

6.5. Commanding General, AAF

The Commanding General, AAF is responsible for execution of fire-prevention and protection at all class III installations, subject to provisions of paragraph 6.4a(2).

6.6. Chiefs of Ordnance and Chemical Warfare Service

The Chief of Ordnance is charged with staff supervision and command responsibility for fire prevention and protection at class IV installations under his direct command which manufacture, process or store explosives, propellants, or explosive ingredients. The Chief of Chemical Warfare Service performs the same functions for class IV installations under his direct command which manufacture, process, or store explosive, incendiary, poisonous, vesicant, or irritant products. By specific agreement with the Chief of Engineers, they may be delegated responsibility for carrying out fire-prevention and fire-protection measures at class IV industrial, manufacturing, or agent-operated installations not included above; however, delegation of responsibility for execution will *not* alter responsibility for staff supervision and technical inspections assigned the Chief of Engineers and commanding generals of service commands. (See pars. 6.4 and 6.8.)

6.7. Chief of Transportation

The Chief of Transportation is charged with staff supervision and command responsibility for fire prevention and protection at ports of embarkation under his direct command, including staging areas and other subinstallations of ports of embarkation.

6.8. Commanding Generals of Service Commands

Commanding generals of service commands are responsible for adequate fire-prevention and protection measures at class I, II, and IV installations, except as indicated in paragraphs 6.6 and 6.7; and for making technical inspections of class III installations charged to the Chief of Engineers. (See par. 6.4a(2).) This responsibility generally is carried out by service command engineers and post engineers. At installations where the Installation Security Inspection Responsibility List makes commanding generals of service commands responsible for production security inspections, the fire-prevention and fire-protection portions of the inspections may be delegated to representatives of the service command engineer

or the service command director of security and intelligence. If their respective activities can be coordinated without duplication, representatives of both may inspect.

6.9. Commanding Generals of Air Forces and AAF Commands

Commanding generals of air forces and AAF commands are responsible for carrying out fire-prevention and protection measures at class III installations under their jurisdiction.

6.10. Service Command Engineers

In carrying out the responsibilities of commanding generals of service commands at class I, II, and IV installations, service command engineers will—

a. Coordinate and carry out the fire-protection and fire-prevention program at all posts in maintenance area.

b. Achieve proper distribution of fire-fighting equipment and facilities.

c. Supervise training of fire department personnel.

d. Inspect equipment in service and take necessary steps to improve its condition.

e. Review the training and operating effectiveness of fire department personnel.

When making technical inspections of class III installations, the service command engineer will assist in performance of the functions listed above on request.

6.11. Post Commanders

Post commanders and officers in charge of new construction projects under jurisdiction of the Chief of Engineers are primarily responsible for fire prevention and protection at their installations or projects. Where new construction projects are undertaken at activated installations, fire-prevention and fire-protection responsibilities of the officer in charge of construction will be coordinated with those of the installation commander.

6.12. Post Engineers

Where the commanding general of the service command, air force, or AAF command is responsible for performance of fire prevention and protection, the post engineer, designated fire marshal by the post commander, will be responsible for administration and organization of the following fire-protection and fire-prevention activities:

a. Setting up and enforcing regulations and orders to reduce or eliminate all fire hazards in the area under his jurisdiction.

b. Organizing, instructing, and training designated fire-fighting personnel in all phases of maintenance and operation of fire apparatus, appliances, and systems.

c. Adequately distributing, installing, and maintaining all fire-protection equipment and systems.

d. Making regular periodic inspections of all buildings and tests of fire-protection systems, apparatus, and equipment, including recharging fire extinguishers.

e. Issuing necessary orders to fire department personnel to regulate duties affecting routine operations, fire-prevention inspections, and fire-fighting duties.

f. Investigating fires immediately to determine the cause, preserve all pertinent evidence, and prepare required reports and records.

g. Preparing reports, requisitions, and recommendations for necessary improvement or reduction in fire protection and fire prevention.

6.13. Organization of Post Fire Department

A fire-protection and fire-prevention system will be organized and maintained at each post. Where mobile fire protection is readily available from surrounding municipalities or other outside sources or where use of motor-driven fire apparatus is otherwise inadvisable, the system will consist of one or more organized fire brigades composed of enlisted men and/or civilians on duty at the post. Post fire department personnel will be divided into two equal groups, as prescribed by the Commanding General, ASF for class I, II, and IV installations or by the Commanding General, AAF for class III installations. Normally these tours of duty will be alternate 24-hour tours of duty with extra tours off as authorized. Members of post fire departments will be subject to emergency duty at all times.

6.14. Advisory Service

The services of engineers of the National Board of Fire Underwriters are available to the War Department for engineering and advisory service. The services of these engineers may be obtained from the Fire Prevention Branch, Repairs and Utilities Division, OCE. Requests will be limited to major fire-protection problems.

Section III. PERSONNEL

6.15. Fire-prevention Engineers

Fire-prevention engineers with a thorough knowledge and background of experience in planning, developing, and maintaining suitable fire-prevention and fire-protection facilities are employed by OCE and by offices of service command engineers. Fire prevention engineers in OCE will be responsible to the Chief, Fire Prevention Branch, Repairs and Utilities Division, OCE, and those in offices of service command engineers will be responsible to the Chief, Fire Prevention Branch, Repairs and Utilities Division of the service command, for coordinating all fire-protection and fire-prevention activities under the jurisdiction of those offices. They will also make technical inspections of AAF installations to ascertain that prescribed standards, procedures, and policies are being followed.

6.16. Fire Department Instructor-inspectors

Fire department instructor-inspectors, fully trained and experienced in fire-fighting operations, and inspecting, organizing, training, and determining of fire-protection requirements, are employed by OCE and by offices of service command engineers. OCE fire department instructor-inspectors will make regular inspection visits to each service command engineer office and to a suitable number of representative posts in each service command, in company with fire department instructor-inspectors under the service command engineer, to determine the adequacy of the fire-protection inspection and training program maintained by the service command engineer. They will also help the service command fire department instructor-inspectors organize inspection, post fire department organization, and training activities. On request through the service command engineer, posts and service commands can get the assistance of fire department instructor-inspectors for special purposes. They will, upon request, help train fire personnel at class III installations and will make technical inspections of such installations to ascertain that prescribed standards, procedures, and policies are followed. Requests for temporary loans of serv-

ice command instructor-inspectors between service commands for special purposes, such as training schools, conferences, emergency operations, etc., will be coordinated through the Fire Prevention Branch, OCE. Commanding generals of service commands will cooperate in the interservice command assignment of instructor-inspectors for special purposes.

6.17. Fire-truck and Equipment Inspectors

Fire-truck and equipment inspectors with thorough training and experience in mechanical operation and maintenance of motorized fire apparatus, pumping equipment, and fire-fighting appliances are employed by OCE and by offices of service command engineers. OCE fire-truck and equipment inspectors will make regular inspection visits to each service command engineer office and to a suitable number of representative posts in each service command, in company with fire-truck and equipment inspectors under the service command engineers, to determine the adequacy of the fire-truck and equipment maintenance program maintained by the service command engineer. They will also help organize maintenance activities of the service command fire-truck and equipment inspectors. Through the service command engineer, posts and service commands can request the assistance of fire-truck and equipment inspectors for special purposes. They will, upon request, help train fire personnel at class III installations and will make technical inspections at such installations to ascertain that prescribed standards, procedures, and policies are followed. Requests for temporary loan of service command fire-truck and equipment inspectors between service commands for special purposes, such as training schools, conferences, emergency operations, etc., will be coordinated through the Fire Prevention Branch, OCE. Commanding generals of service commands will cooperate in the interservice command loans of fire-truck and equipment inspectors for special purposes.

6.18. Post Fire Personnel

Normally, post fire-fighting personnel, including fire chiefs and assistant fire chiefs, will be civilian

employees. Enlisted personnel from station complements will not ordinarily be assigned to full-time fire-fighting duty, but may be designated as auxiliary fire-fighting personnel by the post commander and organized and trained to supplement civilian full-time fire fighters. They will be required to report for training and to respond to fire alarms, and at such times will be under the post fire chief's direct supervision.

a. STRENGTH. Authorized strength of post fire personnel will be kept to the minimum consistent with post needs. Allowances will be based on the number of fire trucks in regular service and on the normal duties of the post fire department, such as inspection, training, routine duties, fire-alarm operation, maintaining fire-protection equipment, and fire fighting. Personnel will not be authorized for special brush fire trucks or other auxiliary or reserve types of fire apparatus unless such apparatus is considered to offset the need for regular fire trucks. Additional personnel will be authorized only with approval of the commanding general of the service command, air force, or AAF command.

b. REPLACEMENT OF PERSONNEL ON TERMINAL LEAVE. Fire department personnel on leave without pay or on terminal leave are classified in the nonauthorized types and such as are not charged against authorized personnel ceiling figures. Replacement personnel may be employed without waiting for expiration of replaced personnel's terminal leave.

c. CLASSIFICATION. Post fire-fighting personnel will be classified in accordance with job specifications listed in the Manual of Standard Job Descriptions, CPR 20.9, published by the Office of the Secretary of War, and assigned to one of the following jobs:

- (1) Fire chief.
- (2) Assistant fire chief.
- (3) Crew chiefs.
- (4) Fire-fighter drivers.
- (5) Fire fighters.

Duties of each classification are discussed in the paragraphs that follow.

6.19. Fire Chief

a. GENERAL. The post fire chief will be responsible for the technical efficiency of fire-fighting personnel in his organization and for the

mechanical operating efficiency of all fire apparatus and equipment entrusted to his care.

b. DUTIES. His duties are—

(1) Conduct fire drills and instruct personnel in proper use of all fire apparatus and equipment.

(2) Qualify himself to detect improper methods used by his personnel in performing their duties.

(3) Make or direct regularly scheduled inspections of all buildings, areas, and installations of fire-extinguishing equipment and systems; keep records of defects noted and action taken to correct them.

(4) Keep a log record book and any other records needed to show all fire department activities, including tests, drills, fires, installation of additional equipment, recharging date of fire extinguishers, etc.

(5) Keep all fire extinguishers in serviceable condition, properly charged, and adequately distributed in accordance with TM 5-687 and TM 5-603 (when published).

(6) Insure that motor-driven or other apparatus assigned to fire department responds on schedule to all fire alarms; take charge of laying hose lines and operating all fire-fighting equipment; and bring maximum required fire protection into service in case of fire.

(7) Enforce systematic and workmanlike execution of all routine fire department activities; keep all equipment and apparatus entrusted to his care clean and serviceable; and insure that fire department personnel conduct themselves properly at all times when carrying out their duties.

(8) Assume full authority over all fire-fighting units while responding to and fighting a fire, unless it becomes apparent to his responsible superior that he is not competent to handle a situation.

6.20. Assistant Fire Chiefs

Assistant fire chiefs will help fire chiefs carry out their prescribed duties, and will perform any other duties assigned them by the fire chief. In the fire chief's absence, the senior assistant fire chief present will assume his duties.

6.21. Crew Chiefs

Crew chiefs will be responsible for supervising operation of a group of fire fighters and fire-

fighter drivers assigned to a single piece of fire apparatus or to a group of fire trucks in service in a single fire station. Crew chiefs will be responsible for operation of groups under their supervision; they will be in charge of fire-fighting operations pending the arrival of a superior fire officer.

6.22. Fire-fighter Drivers

Fire-fighter drivers will be responsible for proper operation of motor fire apparatus in responding to, operating at, and returning from all fires. Drivers will also be responsible for proper care and upkeep of their apparatus at all times, and will engage in frequent practice drills to insure prompt and efficient functioning of both men and equipment at all times.

6.23. Fire Fighters

Fire fighters will be responsible to the fire chief or assistant fire chief and will perform routine and fire-fighting duties assigned them by their superiors.

6.24. Fire Watchers

Watchmen required to patrol certain buildings and whose principal duties are fire and smoke detection and the prompt sounding of fire alarms are not repairs and utilities fire-prevention personnel. The post engineers only relation to these watchmen is that the post engineer is responsible that an adequate program for fire prevention, including preventive regulations and inspections, is carried out at the post.

Section IV. FUNDS

6.25. Equipment

a. CENTRALLY PROCURED. OCE will budget funds for procuring centrally procured items of fire equipment; repairs and utilities funds controlled by OCE will be used.

b. LOCALLY PROCURED. Locally procured equipment and operating supplies will be provided from repairs and utilities funds allotted for post maintenance.

c. INSTALLED. Installed fire-protection equipment and systems, including fire-alarm and sprinkler systems, will normally be provided as new construction and paid for from construction funds controlled by OCE. Repairs and utilities funds may be used for work of this nature in accordance with current instructions governing use of construction and repairs and utilities funds. (See par. 1.14.)

6.26. Personnel

Fire-fighting personnel will be paid from repairs and utilities funds allotted for post maintenance.

6.27. Contracts and Services

Repairs and utilities funds allotted for post maintenance will be used to meet contract obligations involving provision of fire-protection services. Service commands may finance centrally placed contracts for services to a group of posts. Applicable charges will be made against the respective posts for cost-accounting purposes.

6.28. Exempted Installations

a. FUNDS. At installations exempted from service command or AAF command jurisdiction for fire protection, repairs and utilities funds allotted from the service command or AAF command will not be used for personnel, locally procured equipment, operating supplies, or maintenance.

b. EQUIPMENT. Installations exempted from service command or AAF command jurisdiction for fire protection will be furnished centrally procured fire equipment without reimbursement.

Section V. EQUIPMENT

6.29. Centrally Procured Equipment

All major items of fire equipment, including fire trucks, auxiliary pumping equipment, hose, fire extinguishers, miscellaneous fire appliances, connections, fittings, and tools will be procured centrally. They will be issued to posts, camps, and stations by requisition from stocks maintained in engineer warehouses in each service command. For equipment available for issue from centrally procured stocks, see ASF Catalog ENG 5.

6.30. Locally Procured Equipment

On presentation of complete justification, the Chief of Engineers may authorize local procurement of nonstandard items of fire equipment which are not carried in stock.

6.31. Maintenance and Operating Supplies

Expendable maintenance and operating supplies will be procured locally as needed. Stock level of such supplies on hand at the post will be kept to the minimum needed for operating requirements. From time to time, production supply and demand conditions may require service command or Chief of Engineers bulk procurement and storage of some operating supplies. In those instances, each installation will be given suitable instructions for requisitioning supplies.

Standard fire-protection operating supplies which are kept in engineer warehouses are primarily for troop and oversea supply purposes; however, on submission of justification, they are available for emergency issue to posts, camps, and stations in limited quantities.

6.32. Repair Parts

Normally, repair parts for fire equipment at posts, camps, and stations will be procured locally. Replacement pumps and major mechanical repair parts for fire trucks and auxiliary pumping equipment will be procured centrally and obtained by requisition on OCE. Repair parts for vehicle chassis for commercial, special engineer, and other nonstandard ordnance ve-

hicles will be obtained through ordnance service command shops; parts for standard ordnance vehicles, from ordnance stocks of spare parts.

6.33. Requisitions

Requisitions for fire equipment stocked centrally will be submitted on standard requisition form to service command engineers for approval, together with complete justification. Requisition for post engineer fire equipment will be processed in accordance with TM 38-220.

6.34. Fire Equipment for Troop Supply

Fire equipment for troop supply purposes will be requisitioned in accordance with TM 38-220.

6.35. Fire Trucks

a. CLASS 750 AND 500 PUMPER FIRE TRUCKS. Normally, class 750 and 500 pumper fire trucks will only be provided for installations with an installed water supply system which can maintain a fire flow equal to the pumper capacity. Class 750 and class 500 fire trucks may be provided where no installed water supply system exists, if there is available reliable water source, such as a river, pond, reservoir, harbor, etc. Since the supply of class 750 fire trucks is limited, they will ordinarily be distributed only to major storage depots, ports, hospitals, and major airfields where long hose lines may be required.

b. CLASS 325 AND 300 BRUSH OR FORESTRY FIRE TRUCKS. Class 325 and class 300 brush or forestry fire trucks will ordinarily be assigned as auxiliary vehicles at installations which have large areas without installed water supply system and which are subject to severe grass, brush, or forest fires. They may also be issued for primary protection at small installations with no installed water supply system.

c. CLASS 530 FIRE TRUCK. A new fire truck known as the class 530 fire truck is now being standardized for general use in the Army. This truck will succeed all class 300, 325, 500, and 525 trucks. The truck consists of a 500-gpm pump and a 600-gallon water tank mounted on a

2½-ton 6 x 6 chassis. The existing models of trucks will be used as long as they are serviceable. When replacement is necessary it will be by a class 530 truck. When this replacement is completed, the class 750 and the class 530 will be the only standard fire trucks in general use in the Army.

6.36. Reserve Pool of Motor Fire Apparatus

Service command engineers will maintain under their accountability a reserve pool of motor fire apparatus for assignment to class I, II, III, and IV installations as necessary so that fire protection at posts, camps, and stations will not be depleted while motor fire apparatus, normally in service, is undergoing major repairs. As a guide in determining the number of pool trucks, a ratio of one reserve vehicle for every 20 trucks in service at class I, II, III, and IV installations within the service command will be used. The types of vehicles in the reserve pool will be as determined by the service command engineer following consideration of the types of vehicles in service throughout the service command jurisdiction.

6.37. Auxiliary Pumping Equipment

When justified, auxiliary pumping equipment consisting of fire type pumper trailers and skid-mounted pumping units may be obtained to supplement self-propelled fire trucks.

6.38. Transportation for Fire Chief and Fire Marshal

At major posts, camps, and stations covering large areas, suitable administrative motor vehicles will be assigned to the fire department for the use of the fire chief and the fire marshal when responding to an alarm of fire or when carrying out their responsibilities pertaining to fire inspections and to the maintenance and recharging of fire extinguishers. Such vehicles may be equipped with siren, red light, and other necessary equipment and identifying devices to be installed locally. They may also be painted red in accordance with AR 850-15. Such vehicles will be made permanently available to the fire chief and the fire marshal.

6.39. Fire Extinguishers

a. **WATER TYPE.** Water type hand fire extinguishers will be installed for basic fire protection in all barracks, warehouses, hospitals, and other types of buildings.

b. **FOAM TYPE.** Foam type hand fire extinguishers will be installed in especially hazardous locations where fires involving oils and greases are probable.

c. **CARBON TETRACHLORIDE TYPE.** Carbon tetrachloride type hand or wheeled fire extinguishers will be installed in especially hazardous locations where there is the possibility of fire involving oils and greases, machinery, and live electrical equipment.

d. **CARBON DIOXIDE TYPE.** Carbon dioxide type hand or wheeled fire extinguishers will be installed in especially hazardous locations where fires are likely to involve oils, greases, gasoline, sensitive machinery or equipment, and live electrical installations.

e. **WHEELED TYPE.** Wheeled type fire extinguishers will ordinarily be installed only where extraordinary hazards exist and where motorized fire apparatus is remote or inaccessible.

6.40. Fire Hose

a. **TWO AND A HALF-INCH HOSE.** Normally, enough 2½-inch hose will be issued to supply a complete working load of hose for each fire truck in actual service, with specified spare load in reserve. On presentation of suitable justification, 2½-inch hose will also be authorized for use with hose carts and yard hydrants.

b. **ONE AND A HALF-INCH HOSE.** Normally, enough 1½-inch hose will be authorized to provide a complete working load for each brush or forestry type fire truck, with a reasonable spare load in reserve. In addition, 1½-inch hose will be authorized for small lines on regular fire pumper trucks at depots, hospitals, airfields, and similar installations, and for use with installed standpipes.

c. **BOOSTER, CHEMICAL, AND HIGH-PRESSURE HOSE.** Booster, chemical, and high-pressure hose will be provided as needed to maintain required amounts on fire trucks and wheeled type fire extinguishers.

d. **SINGLE- AND DOUBLE-JACKET FIRE HOSE.**

Double-jacket fire hose is standard for War Department use. Use of single-jacket fire hose will be necessary from time to time, but it should be distributed and used only where light water pressures will be encountered. Single-jacket hose should not be used at important depot, port, and hospital installations, or at airfields where long hose lines and higher pressures are anticipated.

e. LIMITATIONS ON USE OF SMALL HOSE LINES. Small hose lines are primarily for small fires to minimize water damage. Their limitations must be recognized. Fire department personnel must recognize when control of water damage becomes secondary to control of fire. Equipment for changes from small to large lines must be instantly available. Criteria for the use of various size hose will be found in TM 5-685 (when published).

6.41. Personal Equipment

a. FIRE-FIGHTING CLOTHING. The following fire-fighting clothing will be provided for each full-time civilian or enlisted fire fighter and for each two regularly organized civilians or enlisted fire fighters:

- (1) Boots, rubber, firemen's.
- (2) Gloves, leather, heavy.
- (3) Coat, duck, firemen's.
- (4) Helmet, plastic, firemen's.
- (5) Trousers, bunking, firemen's.

b. DRESS UNIFORM AND WORK CLOTHING. Dress uniforms and work clothing will not be provided for civilian fire-fighting personnel. Employed personnel will provide themselves with any dress uniforms and work clothing which the post commander requires.

c. BADGES AND INSIGNIA. Special badges and insignia will not be provided for civilian fire-fighting personnel. To carry out official duties, ordinary identification badges required for security purposes will be provided from applicable local funds.

d. SPECIAL CLOTHING. Special protective clothing such as hoods, special gloves, face shields, etc., will not be considered personal clothing. Such items will be provided as component equipment in accordance with current Tables of Allowances.

6.42. Gas Masks and Canisters

Requisitions for gas masks and canisters for fire-protection purposes will be submitted by post engineers to Chemical Warfare Service and transmitted through the service command engineer for approval. If approved for issue by the service command engineer, they will be furnished by Chemical Warfare Service without reimbursement.

6.43. Conservation of Carbon Tetrachloride

In order to meet essential military and civilian requirements for carbon tetrachloride, including fire extinguishing liquid, carbon tetrachloride base, it is essential that economies be effected wherever practicable in connection with necessary uses and that unnecessary use and wasteful practices be discontinued. The following restrictions are imposed, and will be followed by all concerned:

a. FIRE EXTINGUISHERS. Fire extinguishers of a type employing a carbon tetrachloride base liquid will be installed strictly in accordance with paragraph 6.39c. Carbon tetrachloride type fire extinguishers will be removed from all vehicles and other equipment placed in dead storage for an anticipated period in excess of 60 days except where such extinguishers are required in vehicles to meet minimum standards for fire protection. Extinguishers so removed will be placed in stock to meet immediate issue requirements. They will be returned to the vehicles or other equipment as required by pertinent regulations only when the vehicle or other equipment is removed from dead storage and put in service. Fire extinguishers employing carbon tetrachloride base liquid will be discharged only in connection with actual fire fighting or essential training operations, or as required for inspection or testing purposes by authorized maintenance personnel. Liquid discharged for test purposes will be carefully conserved and reused.

b. CARBON TETRACHLORIDE LIQUIDS. Except when authorized by the chief of the technical service concerned, or by the Commanding General, AAF, for use as a cleaning agent for specific essential purposes, carbon tetrachloride or carbon tetrachloride base fire extinguisher fluid will not be used for the purpose of cleaning or spotting

clothing or for cleaning automotive or engine parts, firearms, ordnance, or other material or equipment. Solvent, dry cleaning, Federal Specifications P-S-661, is available for all such purposes through established supply channels. Carbon tetrachloride and carbon tetrachloride base fire extinguisher liquid will be kept in airtight closed containers at all times, and every precaution will be taken to prevent loss through evaporation. To avoid the accumulation of excessive stocks of liquid, station stocks will normally be maintained in accordance with principles of TM 38-220. Because small containers are more subject to puncture or crushing in shipment, requisitions for liquids will be placed for the largest size of container available from standard stock lists consistent with need.

6.44. Fire Ladders

a. PORTABLE FIRE LADDERS. Portable fire

ladders previously installed on various types of one- and two-story frame buildings are no longer required at posts, camps, and stations at which motorized fire-fighting equipment is available. Such ladders now installed on buildings may be removed, and the usable material in them made available for other purposes. Ladders which have become unsafe for use will be removed from buildings at such installations. In new construction, portable fire ladders shown on OCE Standard Plans for one- and two-story frame buildings will be omitted at installations where motorized fire equipment is available.

b. PERMANENT WOOD LADDERS. Permanent wood ladders (fire escapes) attached to the outside of all frame buildings more than one story in height, will be maintained in good repair. Ladders will extend above and give access to the roof and be placed to serve as emergency exists from upper floors.

Section VI. FIRE STATIONS

6.45. Number and Size of Fire Stations

The total number of fire stations will be no more than required for adequate distribution of motorized fire apparatus in accordance with current policy. Ordinarily, not more than three pieces of motorized fire apparatus will be assigned to a fire station. Generally, fire stations will be large enough to provide space for one more piece of motorized equipment than is normally in service; however, no extra space will be provided if the station has three or more pieces of equipment in service.

6.46. Type of Fire Station

Fire station design should follow as closely as possible the standard plans developed by the Chief of Engineers.

6.47. Hose-drying Facilities

Special hose-drying towers are not normally au-

thorized. Hose-drying and storage racks should be provided as specified in standard drawings for fire stations prepared by OCE.

6.48. Latrine and Lavatory Facilities

Latrine and lavatory facilities will not normally be installed where sleeping quarters are not provided. The cost of supplying such facilities and the proximity of available facilities in nearby buildings will be the governing factors in most cases.

6.49. Cooking and Mess Facilities

Special facilities for cooking and messing will not be provided in theater of operations type fire stations unless serious interference with duties of fire-fighting personnel would result if they were required to use mess facilities available on the post.

Section VII. INSTALLED FIRE-PROTECTING SYSTEMS

6.50. Fire-reporting Telephone Systems

Fire-alarm facilities at posts, camps, and stations normally will consist of standard fire-reporting telephone systems installed and maintained by the signal officer. Maintenance of manual transmitters and recording devices for these installations is a repairs and utilities responsibility of the post engineer.

6.51. Reporting by Public Telephone Systems

In order to publicize the uniform number at all installations in continental United States, the number 17 is designated as standard for reporting fires from public telephones at all installations. Exceptions will be made at installations where costly equipment modifications would be required or where such change would be impractical for exceptional reasons. The change from existing number to 17 will be made coincident with telephone directory revision. All fire-reporting instructions, including directories, orders, bulletins, placards, and dial cards, will be revised promptly. No change is made in procedure for reporting fires from special fire-reporting telephone equipment such as that covered in paragraph 6.50.

6.52. Automatic Fire-alarm Systems

a. INSTALLATION. Automatic fire-alarm systems are authorized for specific hospital buildings that do not have automatic sprinklers. Where coded automatic alarms are installed in the hospital area, such systems may be extended to cover post warehouse areas. Installation is the responsibility of the Corps of Engineers.

b. MAINTENANCE. The post engineer is responsible for inspecting and maintaining all automatic fire alarms. Original systems are installed under standard OCE specifications which require 1 year of maintenance by the installing contractor. Subsequent maintenance may be done by the post engineer or, at the discretion of the service command engineer, by contract with the installing company or other qualified automatic fire-alarm company. Because these systems vary and are

highly specialized, maintenance by contract is preferable unless qualified personnel are available to the post engineer or the service command engineer.

6.53. Manual Watch-report and Fire-alarm Systems

a. INSTALLATION. Manual watch-report and fire-alarm systems may be installed in the interiors of buildings at depots, ports, and similar storage projects, and for exterior protection at such projects where the required number of exterior fire-alarm stations does not exceed the specified maximum. Otherwise, fire-reporting telephone systems will be installed for exterior protection. Installation is a responsibility of the Corps of Engineers.

b. MAINTENANCE. The responsibility for maintenance of manual watch-report and fire-alarm system is the same as for automatic fire-alarm systems. (See par. 6.52*b*.)

6.54. Fire-alarm Sirens

a. INSTALLATION. Fire-alarm sirens or similar audible alarm devices are authorized for posts, camps, and stations having an organized fire department or fire brigade and requiring general-alarm notification. Requests for fire-alarm-siren installation will be submitted through the same channels as other repairs and utilities projects. Sirens will be provided locally and may be installed by local personnel or by contract.

b. LOCATION OF CONTROLS. Fire-siren controls should be located at headquarters fire station if the fire-reporting telephone system has a private switchboard. If the post does not have a private fire department switchboard, fire-siren controls should be at guard headquarters or other location where there is constant 24-hour attendance. Controls should not be located at the post administrative switchboard nor should post switchboard operators be required to transmit fire calls or *fire-alarm signals* other than directly to the post fire department, unless constant 24-hour attendance is not available elsewhere.

6.55. Criteria for Installation of Sprinkler Systems

The following criteria will be used in the determination of the necessity for installation of sprinkler system and for alterations or extensions to existing sprinkler installations.

a. FOR PROTECTION OF PERSONNEL. In hospitals when construction, occupancy, or exposure is such as to create an undue hazard to patients, and in buildings of combustible construction adapted to personnel occupancy but not designed for the purpose and not comparable to standard War Department structures for similar uses.

b. FOR PROTECTION OF STORED MATERIALS AND SUPPLIES. In storage buildings, piers, or other structures containing materials or supplies of a critical nature, of high monetary value, or of vital importance, and where the type of construction or the nature of contents is such as to subject the contents to serious loss in the event of fire.

c. FOR PROTECTION OF PROCESSES AND SERVICES. In the buildings containing production repair, experimental, or other processes, services, or equipment of a critical nature, of high monetary value, or of vital importance, and where the type of construction or the occupancy is such as to subject the buildings or contents to serious loss or break-down of such function in the event of fire.

d. ADDITIONAL FACTORS FOR PROTECTION OF STORAGE AND PROCESSING BUILDINGS. The following factors will all be considered in determining the necessity for sprinkler systems in storage and processing buildings:

(1) Importance of the particular supplies or services.

(2) Relative quantity of the supplies or services involved to the *available* supplies or services of the same type.

(3) Ability to replace supplies or services by additional production or substitution, including consideration of replacement time, manpower, materials, and costs involved.

(4) Probable frequency and potential severity of fire damage due to the inherent hazard of the structure, materials, or processes involved.

(5) Availability of other facilities which *are* adequately protected for the purpose.

(6) Present and future advantages which would justify the cost of such systems.

6.56. Maintenance of Sprinkler Systems

Automatic sprinkler systems at War Department installations have been installed, at great expense to the Government, for the protection of life and essential materials. Their *installation is only the initial* step in providing the desired protection. The experience of insurance companies over a long period of time conclusively proves that the effectiveness of an automatic sprinkler system is directly proportional to its maintenance, supervision, and inspection. Generally, qualified post engineer personnel will maintain automatic sprinkler systems. Qualified technicians from OCE and from service command engineer offices will assist in special problems. Criteria pertaining to the maintenance of automatic sprinkler equipment are contained in TM 5-695 (when published).

6.57. Testing and Acceptance of Automatic Sprinkler Systems

Post engineer operating and maintenance personnel responsible for the operation and maintenance of automatic sprinkler systems will be present when alarm valves and dry pipe valves are tested prior to acceptance from the contractor of the automatic sprinkler installation. Testing of this equipment is a function of the district engineer responsible for the installation of the system. The district engineer will notify post engineers of the time of such tests. The testing of these valves affords an excellent opportunity to acquaint responsible post engineer personnel with the features of operation and maintenance of automatic sprinkler equipment. The information gained in witnessing the actual operation of these systems should be of great value to the post engineer maintenance personnel in connection with their continuing maintenance responsibilities.

6.58. Standpipes

Permanent standpipes systems will be installed in unsprinkled laundries, theaters, and recreation halls as indicated on Standard Plans, OCE. Standpipe systems may be installed in other buildings, such as those over 55 feet high, those

covering excessively large areas, or those having abnormal fire-protection characteristics, by special authority of OCE.

6.59. Approval of Projects

The Chief of Engineers, under the Commanding General, ASF, is charged with the installation of fire-protection systems, including sprinkler systems, at War Department installations for which he is responsible for construction, except that minor alterations and additions to such systems will be accomplished in accordance with current policies governing repairs and utilities matters. In the execution of these responsibilities, fire-protection systems may be provided where the lack of such systems would result in conditions exceptionally hazardous to human life, or where stored matériel, property, or processes are of such high monetary value or importance to the war effort as to justify installation of such protection, as determined by the Commanding General, ASF, or by the Commanding General, AAF. The closely controlled policy covering installation of automatic sprinklers and fire-alarm systems requires that complete plans and job descriptions on projects authorized by commanding generals of service commands, air forces, or AAF commands be submitted promptly to the Chief of Engineers for technical review.

6.60. Alterations to Sprinklered Buildings

Alterations, additions, extensions, or other modi-

fications to buildings protected by automatic sprinkler or fire-alarm equipment without extension or modification of the sprinkler or fire-alarm equipment decreases the effectiveness of the equipment and exposes the entire building to fire damage. Particular hazards in this connection are the erection of mezzanine floors, decks, bins, partitions, stock inclosures, etc., which prevent the effective distribution of water from fused sprinklers in the event of fire. Alterations, additions, extensions, or other modifications to existing buildings which will impair installed automatic sprinkler or fire-alarm protection will not be undertaken without including provisions for necessary alterations, modifications, or extension of such sprinkler or alarm systems.

6.61. Painting Fire-protective Devices

Sprinkler heads and thermostatic alarm and activating devices will *not* be painted. Previous directives remain in effect requiring distinctive painting of other fire-protective devices for ready identification. Painting of sprinkler heads and fusible links after installation interferes with the free movement of parts, alters temperature characteristics, and may render them inoperative. Sprinkler heads and fusible links so painted will be replaced, not merely cleaned. When painting sprinkler piping or areas near sprinklers, heads may be protected by covering with a paper bag which will be removed immediately following painting.

Section VIII. OPERATIONS

6.62. Training

a. BY CHIEF OF ENGINEERS. The Chief of Engineers will prepare manuals on fire-fighting technique and on inspection and maintenance of equipment for publication by the War Department. Intercommand training conferences to develop and promote improved and uniform methods will be arranged as needed.

b. BY SERVICE COMMAND ENGINEERS. Each service command engineer will hold centralized training conferences and schools in all phases of fire prevention and protection to develop and promote improved uniform methods throughout the service command. Service command engineer personnel will also help organize individual training courses at posts, camps, and stations.

c. BY POST FIRE DEPARTMENT PERSONNEL. A continuous fire-prevention and fire-protection training program will be established for fire department personnel at each post. Auxiliary fire personnel and other post personnel will be trained as needed. Arrangements will be made for periodic demonstrations and instructions in the use of portable hand fire extinguishers located throughout War Department buildings. This can be done effectively by discharging certain types of extinguishers before occupants of the buildings at the time the extinguisher is ready for recharging. Appropriate placards distributed under the Army Conservation Program and indicating the type, use, and operation of common extinguishers will be conspicuously posted so long as available. See paragraph 6.43 on conservation of carbon tetrachloride in training operations.

6.63. Inspections

a. BY CHIEF OF ENGINEERS. OCE fire-prevention personnel will inspect representative service command installations often enough to determine the adequacy of the service command program.

b. BY SERVICE COMMAND ENGINEERS. Service command fire department instructor-inspectors and fire-truck and equipment inspectors will inspect all major installations, including class III

installations quarterly, and all less important installations semi-annually. Special installations will be inspected more often, at intervals set by the commanding general of the service command. Service command fire-protection and equipment reports will not be forwarded to the Chief of Engineers except in the following unusual cases:

(1) Reports indicating need for change in policies, procedures, or criteria.

(2) Fire truck and equipment inspection reports indicating need for basic design changes, major repairs due to unusual circumstances or recurrent defects, or improvements in maintenance or operation affecting preventive maintenance.

(3) Reports for interpretation of basic policies, clearance with higher authority, or coordination with other agencies.

(4) Reports to accompany WD AGO Form 5-25, when they contain recommendations which are the basis of the project estimates or present evidence for justification.

(5) Reports indicating failure to comply with previous recommendations involving class III installations, for processing through the Chief of Engineers to Commanding General, AAF.

c. BY POST FIRE DEPARTMENT PERSONNEL. A continuous program of fire prevention and maintenance inspection of all buildings, processes, and fire equipment will be established at each post and will be carried out primarily by post fire department personnel. Its purpose will be—

(1) Control and abatement of fire hazards.

(2) Development of familiarity with buildings, processes, abnormal hazards, and other local conditions.

(3) Check-up of condition of fire equipment to keep it ready for instant use.

Inability to gain entrance to buildings because of the absence of the responsible personnel or because of the vacated status of the building will not be considered sufficient reason for the performance of only a cursory inspection. Particular effort will be made to inspect completely those buildings which are not occupied daily or at frequent intervals, and those buildings which are used for storage.

6.64. Fire-loss Records

a. **BY CHIEF OF ENGINEERS.** The Chief of Engineers will receive reports of fire damage submitted by all posts, camps, and stations in accordance with applicable regulations; will review and analyze fire causes and distribute information and statistics covering fire-loss experience of the War Department; and will submit to higher authority an annual report of fire-loss experience together with any necessary reports.

b. **BY SERVICE COMMAND ENGINEERS.** Service command engineers will review and record the fire-loss experience within their respective service commands, including class III installations; will initiate necessary corrective action indicated by fire-loss records; and will submit fire-loss reports when required.

c. **BY POST FIRE DEPARTMENT PERSONNEL.** Each post will keep a complete record of fire-loss experience, prepare reports of all fire damage for submission to higher authority in accordance with pertinent regulations, and compile such fire-loss statistics as the post commander may require.

6.65. Outside Aid

a. **OUTSIDE FIRE DEPARTMENTS.** Specific arrangements should be made for outside fire departments to assist post fire departments. Contracts may be made to provide such additional protection for a reasonable consideration. The Comptroller General has ruled that in view of the legal duty of a municipality to extinguish all fires within its limits, the Government is under no legal obligation to make payment to a city for fire-fighting services rendered in connection with a fire at a Government reservation located within the city limits unless there is a specific contractual obligation to that effect. (B-47142, 7 Feb 45.) Arrangements for response of post fire departments to areas outside the military reservation may be made at the discretion of the post commander if the arrangements will not endanger post fire protection. Arrangements for response of post fire departments to areas outside the military reservation may be made at the discretion of the post commander if the arrangements will not endanger post fire protection.

b. **FORESTRY FIRE PROTECTION.** The post engineer should arrange for the assistance of ap-

propriate Federal or State forestry services in problems involving control of fires in brush or forested areas of posts.

c. **WATER FRONT PROTECTION.** In areas under the water front jurisdiction of the Coast Guard but where protection of water front property is a function of the post fire department, the post engineer will arrange in advance for coordinating operations with the Coast Guard.

6.66. Utilities Services Assistance

The post engineer will arrange in advance for electric-, water-, and gas-utility personnel to respond to serious fires on receipt of a prearranged signal.

6.67. Inspection Criteria for Fire-fighting Equipment at AAF Installations

Fire-fighting equipment issued by the Chief of Engineers or commanding generals of service commands to AAF installations will be inspected and maintained in accordance with established procedures and instructions covering this subject.

6.68. Flameproofing Decorations

Serious hazards result from the indiscriminate use of flammable decorating material, especially during holiday seasons. Combustible decorative materials, such as tinsel, streamers, scenery, and cotton batting, will be made flameproof. For information and methods of flameproofing, see TM 5-685 (when published). Under no circumstances will the use of open flames, including candles, for decorative schemes be permitted. Electrical devices, such as tree lighting sets, decorative lighting outfits, and extension strings, will be of types tested and approved by Underwriters' Laboratories. All holiday decorations will be taken down within 1 week following the holiday, and will be immediately removed from the premises and disposed of. Flammability of Christmas trees and similar vegetative decorations may be reduced by placing them in a stand having a reservoir of water.

6.69. Fire Precautions in Handling DDT

a. **COMPOSITION AND FORMS.** Insecticide DDT in its pure form is a white crystalline substance with a melting point of 107° to 108° C; it is

stable under most conditions. It is nearly insoluble in water, moderately soluble in petroleum and vegetable oils, and readily soluble in many organic solvents. The fire and explosion hazard of DDT solutions is that of the solvent. DDT is normally used in one of three forms:

(1) It may be ground to a dust with talc or pyrophyllite for use as a louse powder. No fire hazard is apparent in this form.

(2) It may be used in the form of an emulsion concentrate dissolved in Xylene as a residual spray. Xylene is a highly flammable organic solvent requiring storage and handling safeguards on that basis. Detailed precautions against this hazard are covered in *b* below.

(3) It may be used as a residual spray in solution in petroleum products such as kerosene and fuel oils with methylated naphthalene added. Detailed precautions against this hazard are covered in *c* below.

b. HAZARDS WHEN USED WITH HIGHLY FLAMMABLE SOLVENTS. As a protection against the hazards incident to use of DDT as a spray in highly flammable solvents such as Xylene, the following precautions will be observed:

(1) The main switch controlling electrical equipment in the building will be opened. In cases where the building is piped for gas, the main gas control valve will be closed by qualified post engineer personnel. A thorough clean-up of the building will be made and all refuse and other needless combustible material removed from the premises. Only those persons actually engaged in the spraying operations and work incidental thereto are to be permitted in the building until ventilation is completed.

(2) Until adequate ventilation has been provided (normally within 4 hours after spraying is completed), the use of matches and other unprotected flames must be prohibited. No heating system will be used other than low pressure steam or hot water, and then only when the heating plant is unexposed to flammable vapors being produced.

(3) When electrically-driven compressor units are used, the power unit or motor should either be of vaporproof type or kept outside of buildings. Internal combustion engines must not be taken into buildings being treated.

(4) Due to a temporary increase in combustibility of materials and structures which have been sprayed, smoking will be prohibited for a period of at least 24 hours.

(5) When preventive treatment of mattresses and similar items are conducted on a large scale, safeguards of the type recommended for paint spraying will be enforced.

c. HAZARDS WHEN USED WITH KEROSENE. Methylated naphthalene added to kerosene when increased solubility is required does not increase the fire hazard of kerosene. The hazard of such solution is the same as that of the common space type fly sprays. When DDT in kerosene or kerosene-methylated naphthalene solutions is applied as a residual spray by competent trained personnel using a hand pump knapsack type of sprayer, with open flames and temperatures exceeding 100° F. avoided, it may be assumed that no explosion hazard exists. Under these conditions, the fire hazards of liquid kerosene only, need be guarded against by the following precautions:

(1) Electric motors, light bulbs, and other sparking or heating equipment will be kept from the zone of spray.

(2) Smoking and open fires will be prohibited until ventilation and drying are completed.

(3) Ventilation will be provided by opening doors and windows of buildings sprayed.

(4) Kerosene will not be atomized in buildings by power sprayers at high pressures and relatively high temperatures as such will cause the kerosene to fog, thus greatly reducing the safety normally associated with kerosene.

d. HAZARDS IN STORAGE. Suitable protective measures will be applied in those instances in which large regional stocks of DDT dissolved in kerosene or in Xylene may be stored in depots.

e. COOPERATION WITH ENTOMOLOGISTS. Personnel charged with fire prevention will cooperate with service command entomologists and familiarize themselves with the methods used in the application of DDT by witnessing tests and demonstrations being conducted.

6.70. Operation of Water Supply Systems for Fire Protection

For policy on operation of water supply systems for fire protection, see paragraph 5.90.

6.71. Fire Hazards Incident to Mechanical Refrigerators

Domestic type mechanical refrigerators are not equipped with explosionproof temperatures controllers or door switches. They are not safe repositories for open containers of such highly flammable volatiles as ether or gasoline. To elimi-

nate this hazard, the storing of open containers of flammable volatiles in mechanical refrigerators will be discontinued. It is not practical to modify existing mechanical refrigerators to render them explosionproof. Where operational procedures require cooled storage for small quantities of such liquids in open containers, ice refrigeration is suggested.

Section IX. FIRE PROTECTION FOR SPECIAL FACILITIES

6.72. Projects Under Construction

The Fire Prevention Branch, Repairs and Utilities Division, OCE, is responsible for fire protection and fire prevention at all construction projects under jurisdiction of the Chief of Engineers. This responsibility is executed through the echelons under the Chief of Engineers, including division and district engineers. Technical fire-prevention personnel under the service command engineer will cooperate in discharging the responsibilities of division and district engineers. For construction projects located at active installations, fire-protection and fire-prevention work will be coordinated with the post fire-protection and prevention program.

6.73. Facilities Adapted for Troop Housing and Hospitalization

Facilities leased or owned by the War Department and adapted to troop housing should be thoroughly investigated by the division engineer at the time of their conversion and inspected at recurrent intervals thereafter by the service command engineer to insure that the level of fire safety conforms to War Department standards promulgated by the Chief of Engineers. Particular attention should be given to exits, conduct of fire drills, maintenance of suitable fire-alarm signals and warning devices, first-aid fire appliances, stand-pipes, fire doors, electric wiring and fixtures, heating facilities, regulation of smoking, watchman service, and general housekeeping. The degree of fire protection at such installations will depend on the type of housing or hospitalization contemplated. Safety to life is of primary importance.

6.74. Leased Storage Facilities

The War Department's fire-protection responsibilities will extend to private facilities which it leases for storage purposes. Division engineers will make certain that Army standards of fire protection are maintained in such facilities at the time of acquiring the leasehold; inspections should be conducted at suitably frequent intervals by qualified fire-inspection personnel from the ser-

vice command engineer's office. Generally, these properties are located within municipal boundaries and satisfactory exterior fire protection may be afforded by municipal facilities. Occasionally additional Government-furnished protection may be warranted.

6.75. Leased Premises Partially Occupied

The Chief of Engineers has stated the minimum safeguards necessary to protect personnel housed in partially occupied leased premises, such as portions of hotels or other commercial facilities. Facilities partially occupied for these purposes should be leased by division engineers and maintained by post engineers in accordance with minimum safeguards.

6.76. Army Specialized Training Program and AAF College Training Program Schools

When facilities provided for Army Specialized Training Program schools and AAF College Training Program schools are accepted, division engineers will investigate them thoroughly for their suitability from the standpoint of fire protection. Service command engineers will direct qualified fire inspectors to make periodic inspections of these facilities to insure that Army standards of fire protection are maintained. A copy of the inspection report will be sent to the commanding officer of the installation for appropriate action. When the institution fails to take corrective action recommended by the division engineer, an information copy will be sent to the Chief of Engineers.

6.77. Places of Public Assembly

At places of public assembly under War Department jurisdiction, inspections of the adequacy of fire-protection measures will be especially careful, with particular attention given to structural features and means of exit. Similar inspections should be made of public places which are not under War Department jurisdiction but are on or near Army posts if they are used frequently by large numbers of military personnel. Usually,

post engineer fire personnel will make these inspections and report any unsatisfactory condition to the post commander for corrective action.

6.78. Stand-by, Excess, and Surplus Installations

Maintenance of necessary fire protection at inactive and surplus installations will remain a responsibility of the commanding general of the service command, air force, or AAF command until the division engineer actually takes custody of the property for the Chief of Engineers. The division engineer will be responsible for maintenance of fire protection at surplus installations and facilities which have been turned over to him.

6.79. Prisoner of War Camps

a. SERVICE COMMAND INSPECTIONS AT BRANCH CAMPS. To insure that fire-prevention and fire-protective measures are adequate, division engineers or service command engineers will make initial fire inspections at temporary prisoner of war branch camps leased or converted from other War Department use. Service command engineers will make recurrent fire inspections of these facilities.

b. POST FIRE PREVENTION MEASURES. After prisoner of war details have departed, appropriate checks will be made in buildings where critical articles (such as tires, electrical equipment, truck components, batteries, etc.) are stored. Post guard details or civilian watchmen will perform these principal duties of smoke and fire detection and prompt sounding of the fire alarm by remaining on the premises for at least $\frac{1}{2}$ hour after operations have ceased. See paragraph 6.24 for relationship of post engineer to these fire watchers.

6.80. Post Laundries and Dry Cleaning Plants

a. WATCHMAN. At all post laundries and dry-cleaning plants not equipped with an automatic sprinkler system, a watchman will patrol all portions of the laundry or dry-cleaning plant, including the boiler plant, during periods of non-operation. Watchman's rounds will begin upon the close of operations and will continue on an hourly basis, or more frequently, until operations

are resumed. The principal duties of this watchman will be smoke and fire detection and prompt sounding of the fire alarm. When watchman service in laundries or in dry-cleaning plants is discontinued because of the installation of automatic sprinkler systems, one or more responsible persons from the operating staff will be assigned to make a fire-protection inspection at the close of business each day. Fire prevention precautions will not be relaxed upon the elimination of watchman service. The entire laundry and dry-cleaning facility will be carefully checked daily by the operating staff for fire hazards and the condition of fire-protection equipment. (See par. 6.24 for relationship of post engineer to these fire watchers.)

b. SMOKING. Uncontrolled smoking in post laundries and dry-cleaning plants will be prohibited. Certain safe areas, such as offices and rest rooms, may be designated by the post commander where smoking may be permitted within the laundry or dry-cleaning plant. In such designated areas, adequate facilities will be provided for the safe disposition of smoking materials.

c. VENTS ON DRY-CLEANING MACHINERY. Drying tumblers, DCE-5A and DCE-6B, will be vented separately to the outside of the building. Two or more vents will not be connected. All existing installations will be individually vented as prescribed above.

6.81. Clubs, Day Rooms, and Other Recreational Buildings

Fires occurring during the night in recreational buildings gain considerable headway before discovery and notification to the fire department, thus resulting in the complete destruction of the building. Such recreational buildings include officers' clubs and lounges, NCOs' clubs and recreational rooms, cadet club houses, day rooms, and other buildings or rooms of a similar nature where officers or enlisted men congregate for recreation. To minimize such fires, post commanders will designate suitable individuals, preferably commissioned or noncommissioned officers, to be responsible for a complete inspection of the building at closing time. They will inspect to determine that the contents of all trash containers, soiled paper towel containers, ash trays, and butt cans have been disposed of in a safe manner outside the building. All sofa and chair cushions

will be inspected for smoldering cigarettes, etc. Cushions which are not fixed will be removed for inspection and fixed cushions will be carefully examined.

6.82. Fire Prevention in Storage Installations

Good practices with respect to fire aisles and other clearances for stored supplies are to be recognized in the arrangement, operation, and maintenance of military storage facilities. The basic hazard introduced by the warehouse structure is increased by the character, wide variety, and concentration of stored supplies. Under existing conditions and with the pressure incident to emergency storage and shipping demands, incipient and spreading fires may occur in storage installations. Therefore, extreme caution must be taken to reduce to a minimum the conditions incident to starting fires and the potential extent of spreading fires. In order to fully utilize existing storage space and, at the same time, observe reasonable fire-prevention precautions, it is important that practices as specified herein be adhered to.

a. DEFINITIONS. For purposes of this policy, the following definitions will be used:

(1) *Combustible supplies.* All supplies which can catch fire and burn. Not just those which burn easily, such as paints, oils, and greases.

(2) *Standard interior fire walls.* Walls between sections of a warehouse which are constructed of the following materials and with the following minimum thicknesses: brick masonry, 12 inches; reinforced concrete, 11 inches; or hollow clay tile, 16 inches.

(3) *Substandard interior fire walls.* Walls between sections of a warehouse which do not meet the standards set forth immediately above for standard fire walls.

b. STACK CLEARANCES. The following clearances will be maintained in the stacking of ordinary supplies and equipment:

(1) Below automatic sprinkler heads, if such protection has been installed, clearance will be 18 inches.

(2) Where supplies are stacked *above* the horizontal level of lower roof truss members, clearance between supplies and structural members or other installed devices subject to injury will be 18 inches.

(3) Where stack heights are 15 feet or less, clearance between the top of the stack and lower edge of roof rafters or ceiling joists will be 18 inches.

(4) Where stack heights are over 15 feet, clearance between the top of the stack and lower edge of roof rafters or ceiling joists will be 36 inches.

(5) Where stacking is up to or above the level of electric light fixtures, clearance on all sides of such fixtures will be 18 inches.

(6) Where open knob and tube electric wiring is installed in such a manner that the conductors are exposed to mechanical injury, clearance will be 18 inches.

(7) Solid blocks of supplies, bounded by aisles, will occupy not more than 7,750 square feet; for example, 50 by 155 feet.

(8) The depth from wall to aisle of stacks of supplies along exterior walls will normally be limited to 30 feet.

c. FIRE AISLES. Fire aisles will not be maintained between stored supplies and outer walls regardless of their type of construction, except in the case of supplies presenting special hazards and requiring special precautions. A clear space of 24 inches will be left between stored combustible supplies (including supplies packed in combustible containers) and substandard interior fire walls. A clear space will not be mandatory between stored supplies and standard fire walls.

d. ACCESS AISLES. Aisles will not be maintained solely for access to electrical equipment, fire-fighting equipment, or sprinkler valves, except where such equipment cannot conveniently be moved to a more accessible location. Fire extinguishers, light switches, plug-in sockets, fire-alarm boxes, and other equipment that can be relocated should be placed along transportation aisles or immediately inside and adjacent to large exterior or fire doors. Provision must be made that equipment so located will not obstruct or be injured by traffic in aisles.

e. BLOCKING WAREHOUSE DOORS. Where warehouse doors (cargo and personnel doors) can be closed without seriously interfering with fire fighting or the efficient operation of the warehouse they may be closed, and when so closed will be conspicuously marked from the outside, *this door blocked*. Normally, at least one cross

aisle and connecting exterior doors (provided such doors now exist) will be left open and unobstructed at approximately the center of each 120-foot section or equivalent.

f. FIRE DOORS. Extreme caution should be taken to assure that all fire doors are closed when warehouses are not occupied by personnel. Care should be exercised to insure that fire doors are not blocked at any time. When no space is left between stored supplies and interior fire walls, supplies will be stored so that a clear space of 36 inches will always be left around each fire door, whether the door is open or closed. When a clear space of 24 inches is left between stored combustible supplies and substandard interior fire walls, no additional space will be required around each fire door. This clear space around fire doors will permit inspection of each fire door and its mechanism, and will help to prevent damage to the mechanism from falling supplies. This clear space will also permit a hose stream to be played on the door in case of fire in the adjacent section, thereby preventing supplies near the door from igniting if flames should come in around the door.

g. SEPARATION OF STORAGE BUILDINGS. Standard minimum separations of buildings in warehouse and other storage areas are specified in War Department policy. Buildings of different sizes and types require different distances of separation to reduce the probability of fire spreading from one building to another. The minimum separation of storage buildings is 40 feet between either the ends or the sides of the warehouse. The following distances will be used as a guide based upon the size and type of the building as indicated below:

(1) Warehouses and storage sheds of temporary type of construction less than 2,000 square feet in area will be separated by not less than 40 feet.

(2) Warehouses and storage sheds of temporary type of construction over 2,000 square feet in area but less than 240 feet in length will be separated by not less than 50 feet.

(3) Warehouses and storage sheds of temporary type of construction 240 feet in length or longer will be separated by a minimum of 80 feet and preferably by 100 feet.

(4) In general, warehouses of permanent or

semipermanent types of construction of any size will be separated by a minimum of 80 feet and preferably by 100 feet.

h. STORAGE BETWEEN BUILDINGS. That combustible materials be stored between buildings unless a clear space is left between such materials and each building equal to the minimum separation specified in *g* above. Buildings are separated as a protection against fire, and this purpose is defeated if combustible materials are stored closer to buildings than the minimum specified separation.

i. PARKING OF VEHICLES. Parking of vehicles, especially overnight parking of trucks and motor pool cars, will be carefully regulated so that access to all sides of buildings and fire hydrants is not materially affected.

j. METHODS AND WAIVERS OF COMPLIANCE. So far as these instructions may involve relocation or rearrangement of supplies, compliance will be accomplished through normal receiving and shipping. No new construction or removal of buildings will be undertaken; no major rewarehousing or removal of supplies stored between buildings will be done in order to comply with these instructions. Whenever the commanding officer finds that compliance with these rules is impracticable, he will describe the condition and request a waiver of the specific rule or rules from the Commanding General, AAF, the responsible technical service, or service command. Waivers will not be granted for periods in excess of 90 days, but may be renewed in writing on receipt of written request from the commanding officer. While a waiver is in force, extraordinary precautions must be taken to overcome the possible effect of deviation from standard practice.

6.83. Smoking in Warehouses

Smoking may be permitted in ordinary hazard storage, processing, and industrial warehouse buildings *within designated controlled areas* approved by the fire marshal. A responsible supervisor will inspect at intervals to insure extinguishment of discarded smoking material.

a. CONTROLLED AREAS. Normal fire-prevention practice prohibits smoking in storage, processing, shop and industrial areas, unless buildings and contents are incombustible. An alternate safeguard is to allow smoking in prepared places at

specified hours, providing extra hazardous areas (highly inflammable solids, liquids, and gases) are *not* involved. The effectiveness of this plan lies in the fact that designated places may be supervised while surreptitious smoking in out-of-the-way places cannot be. Controlled areas with incombustible floors will be prepared so that occupants are visible to supervisors. They will be segregated by simple inclosures of gypsum board, cement asbestos board, chicken wire, or other incombustible material which may be mounted

on wood skeleton frame. In combustible receptacles for discarded smoking materials in inclosures will be kept clean by emptying and disposing of refuse in safe locations as necessary, not less than once a day. Specific periods for smoking within these areas will be established.

b. OTHER THAN CONTROLLED AREAS. Smoking in other than controlled areas will be strictly prohibited and steps will be taken to insure enforcement.

Section X. COOPERATION WITH OTHER RESPONSIBLE SERVICES

6.84. Chemical Warfare Service, Ordnance Department, and Transportation Corps

Routine inspection, training, and maintenance services of fire department instructor-inspectors and fire-truck and equipment inspectors may be extended to Chemical Warfare Service, Ordnance Department, and Transportation Corps installations at which the commanding general of the service command is not responsible for fire protection. (See pars. 6.6 and 6.7.) These services will be extended on request by the Chiefs of Chemical Warfare Service, Ordnance Department, or the Transportation Corps or by post commanders.

6.85. Manufacturing Plants

a. RESPONSIBILITY OF OPERATING SERVICE. The following fire-protection and fire-prevention activities at industrial sections of Government-owned and operated Chemical Warfare Service and Ordnance Department armories, arsenals, and proving grounds (par. 1.9) are the responsibility of the operating service:

- (1) Inspection.
- (2) Management of fire department.
- (3) Maintenance of mobile fire equipment.
- (4) Forest-fire protection.
- (5) Maintenance of sprinkler systems.

- (6) Maintenance of alarm systems.

b. EQUIPMENT. Initial and replacement fire equipment will be furnished by the Corps of Engineers without reimbursement in accordance with established allowances. Maintenance and operating supplies other than major replacement items such as motors, transmissions, fire pumps, etc., will be purchased locally by the responsible operating service. Major replacement items will be stocked and furnished without reimbursement, in accordance with authorized allowances, by the Corps of Engineers.

c. TECHNICAL PERSONNEL. On request, the services of qualified technical fire-prevention personnel will be furnished by the Chief of Engineers and by the commanding generals of service commands.

6.86. Charging Fire Extinguishers

Post engineer equipment and facilities for recharging fire extinguishers will be extended to other services in emergencies without reimbursement if they can accomplish recharging more readily than can the using services. If possible, post engineers will meet the requirements of the using service when recharging fire extinguishers for other services.

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INDEX

	Paragraph	Page		Paragraph	Page
Accountability:			Army-Navy airfields, jointly occupied, re-		
Built-in cupboards, cabinets and shelves.	1.47	16	sponsibility	1.7	3
Installed property	1.46	16	Army No. 1 space heaters, procurement..	5.50b	120
Property	1.45	16	Army post, definition	1.62	22
Real property	1.46	16	Arsenals, CWS and Ordnance	1.9	4
Transfer	1.48	16	Ash hoes	5.63	124
Stocks	1.45	16	Asphalt, procurement responsibility	3.17	62
Surplus installations, transfer	1.49	16	Assistant fire chiefs	6.20	146
Additions, funds	1.14	6	Athletic—		
Adjustments between allotments	1.16	7	Facilities:		
Advisory services, fire protection.....	6.14	144	Outdoor	2.44	51
Agricultural—			Use of equipment	4.35	92
Crops, responsibility	3.38b	67	Fields, revegetation projects	3.37	67
Lands—			Auditorium exits	2.43b	51
Leases	3.38d	68	Authority man, tank cleaning.....	5.115	140
Release for crop production.....	3.38c	67	Authorization:		
Responsibility	3.38	67	New construction projects	1.63	22
Air—			Repairs and utilities projects.....	1.63	22
Conditioning, installation policy	5.1	98	Auxiliary pumping equipment	6.37	150
Filters	5.62	124	Bachelor officers' quarters	2.28	42
Aircraft—			Badges for fire fighters	6.41c	151
Crash rescue and crash fire fighting....	6.3	142	Baggage-car conversions	4.21	86
Warning facilities, responsibility	5.5d	103	Bags, coal	5.63	124
Airfield:			Bakery ovens, installation	4.29	91
Night lighting equipment	5.4	103	Banking facilities	2.40	50
Policing	3.33b	66	Barracks and quarters, funds	1.14	6
Airfield pavements:			Base camps, POW	1.3	2
Certificates of necessity	3.8b	59	Bayonet course, maintenance and repair..	2.51a	53
Cleaning and policing	3.5	58	Bedsteads, maintenance	4.18	84
Extensions and additions	3.2	58	Bins, responsibility	4.16	84
Failures	3.7	59	Blinds, venetian	2.22	41
Joint fillers	3.4	58	Block, butcher	4.27	90
Maintenance of leased	3.8a	59	Boiler:		
Marking hazards	3.6b	59	Efficiency	5.52b	121
Parking runways and taxiways	3.6a	58	Equipment	5.51	121
Patching	3.3	58	Feed equipment requirements	5.55	122
Priority work	3.1	58	Firing equipment	5.51b	121
Air force facilities, funds	1.12	6	Inspections	5.58	123
Airplane syringing of DDT	3.64	75	Plant—		
Alien Internment Camps:			Capacity, spare	5.56	122
Funds	1.25	9	Logs	5.52a	121
Responsibility	1.4	2	Performance	5.52	121
Alterations, funds	1.14	6	Plants:		
Ammonia, use in water with chlorine....	5.83c	131	Instruments	5.57	123
Amusement machines, furnishing electric			Manufacturing plants	5.67	125
services	5.17b	106	Operating personnel	5.44	118
Antifreeze solutions	4.45	95	Treatment compounds	5.53c	121
Approval of conversions	1.67	25	Trim	5.51a	121
Approval:			Boiler-water—		
New construction projects	1.63	22	Hydrometers	5.53e	122
Repairs and utilities projects.....	1.63	22	Treatment	5.53	121
Aprons, swimming pools	2.26	41	Boilers, procurement	5.50d	120
Arm racks	2.19	40	Boundary surveys of reservations	2.3	33
Armories, CWS and Ordnance.....	1.9	4	Bowling alleys	2.43c	51
Army committee for insect and rodent			Branch camps, POW	1.3	2
control	3.64	75	Breachings, outside	2.10	36

	Paragraph	Page		Paragraph	Page
Bread cabinets, installation	4.16b	84	Nominal-sum leases	2.35f	47
Brine-spray units	5.68d	126	Procedure for issuance	2.36	47
Buildings:			Railroads	3.25	64
Alterations to sprinklered	6.60	156	Removal equipment	2.35d(1)	46
Dismantling	2.2c	33	Repair defined	2.35d(5)	47
Moving	2.2c	33	Rent free leases	2.35f	47
Numbers	1.70	28	Request to the Chief of Engineers.....	2.35b	46
Painting—			Restoration	2.35d(2)	46
Exterior	2.16a	38	Roads and walks	3.13	61
Interior of—			Submitting requests	2.36a	47
Permanent	2.16c	38	Subsequent repairs	2.35c	46
Temporary	2.16b	38	Work—		
Permanent, definitions	2.6a	35	Outside scope of economy act.....	2.35d	46
Re-erection	2.2c	33	Prior to issuance prohibited.....	2.35e	47
Salvage	2.2a	32	Change of station, funds.....	1.21	8
Salvaged materials	2.2b	33	Chapels for POW	2.46	52
Temporary, definition	2.6b	35	Chlorination of—		
Theater of operations	2.7	36	Sewage	5.84	131
Vacant, on marginal lands	2.50	53	Water	5.83	130
Bulbs, lamp	5.9	104	Chlorine:		
Burglar alarm systems, responsibility	5.5a	103	Procurement	5.85b,d	131
Burn and cover, refuse disposal	3.52	72	Residual	5.83a	130
Burning—			Supply of cylinders	5.85a,c,d	131
Grass	3.35	67	Civilian housing:		
Pits, refuse disposal	3.51	72	Conversion of	2.30b	43
Butcher blocks	4.27	90	Conversion to	2.31	43
Buzzer systems, responsibility	5.5a	103	Civilian housing administered as public		
CAA installations, jointly occupied by			quarters	2.30a	42
AAF	1.8	3	Civilian messing facilities	2.45	51
Cabinets:			Classification of posts	1.68c	26
Bread, installation	4.16b	84	Cleaning airfield pavements	3.5	58
Built-in, accountability	1.47	16	Clothes racks, installation	4.16a	84
Pastry, installation	4.16b	84	Clothing for fire fighters	6.41d	151
Calcium hypochlorite	5.86	132	Clubs, fire protection	6.81	162
Camouflage, definition	3.66	77	Coal:		
Cannisters for gas masks	5.69, 6.42	126, 151	Acceptance of—		
Cannon stoves, procurement of spare parts.....	5.50c	120	Shipment	5.39	115
Canopies	2.11	36	Substandard	5.39	115
Canvas bags for coal-handling	5.35	114	Delivery orders	5.40	115
CAP, responsibility	1.19	8	Emergency purchase	5.18b	108
Carbon dioxide extinguishers	6.39	150	Funds	5.19	108
Carbon tetrachloride:			Hand picking prohibited	5.37d	115
Conservation	6.43	151	Inspection	5.42a	116
Extinguishers	6.39c	150	Invoices	5.40	115
Cemeteries:			Local purchases	5.18c	108
National	3.42c	70	Locomotive and locomotive cranes	5.34	114
Post	3.42a	68	Maintaining adequate supply	5.22	110
Private	3.42b	69	Manufacturing plants	5.33	114
Central heating plant logs	5.52a	121	Purchase orders	5.40	115
Certificates of necessity:			Railroad trestles	5.38	115
Airfields	3.8b	59	Receiving reports	5.41	115
Alteration defined	2.35d(5)	47	Redistribution of excess	5.31	113
Authority of division engineers.....	2.35a	46	Requisitions	5.23	110
CAA jointly occupied facilities.....	1.8	3	To cover overdeliveries.....	5.24	111
Damage	2.35d(3)	46	Responsibility—		
Improvement defined	2.35d(5)	47	For storage and issue.....	5.18	108
Initial alterations	2.35c	46	Procurement	5.18a	108
Limitation on post commander.....	2.36b	47	Reviews of requisitions	5.25	111
Maintenance	2.35d(4)	47			
Defined	2.35d(4)	47			

	Paragraph	Page		Paragraph	Page
Sales to relieve domestic emergencies...	5.30	112	Reporting	1.71b	28
Sampling	5.42b	116	Surplus stations	1.71c	28
Supplied to outposts	5.20	109	Transferred stations	1.71c	28
Surplus	5.32	113	Cost cards, repairs and utilities	1.71b	28
Utilities, definition	5.23d	111	Cost of repairs and utilities projects	1.65	25
Coal—			Cost-plus-a-fixed-fee contracts, prohibition	1.40	15
Bags	5.63	124	Coravol, use in boiler water treatment....	5.53c	121
Contracts:			Corridors, heating in hospitals.....	5.64	124
Changes	5.28	111	Corrosion in water supply systems.....	5.88	132
Review	5.27	111	Cots, maintenance	4.18	84
Conveyors	5.54	122	Cranes, locomotive, coal	5.34	114
Handling equipment	5.35	114	Crash fire fighting	6.3	142
Hods	5.63	124	Crating, responsibility	4.20	86
Shovels	5.63	124	Crew chiefs	6.21	146
Storage, responsibility and methods	5.37	114	Criteria for construction and maintenance.	2.1b	32
Combustion engineers	5.46	119	Critical materials, use	2.1a	32
Communication systems, responsibility	5.5a	103	Crops, cultivation and harvesting	3.38b	67
Concrete floors, dustproofing	2.18	40	Cultivation of crops	3.38b	67
Connection charges:			Cupboards, built-in, accountability	1.47	16
Collections	5.98c	135	Curtains, shower	2.23	41
Payments	5.98a	135	Custodial services:		
Refunds	5.98b	135	Definition	4.22a	87
Conscientious objector camps:			Responsibility	4.22	87
Funds	1.25	9	CWS—		
Responsibility	1.4	2	Armories	1.9	4
Conservation of—			Arsenals	1.9	4
Carbon tetrachloride	6.43	151	Cooperation within fire protection	6.84	166
Fuel, storage system operations	5.107	136	Manufacturing plants	1.9	4
Consolidated reports, repairs and utilities..	1.72	29	Proving grounds	1.9	4
Consolidation of administration	1.10	4	Cylinders:		
Construction—			Chlorine	5.85	131
Economy in	2.1b	32	Government-owned	1.61b	20
Funds	1.14	6	Return of rent	1.61f	20
Policy, application to maintenance and			Supply general	1.61	20
repair	2.1	32	Damage to public property, reports	1.73	30
Projects, fire protection	6.72	161	Day rooms, fire protection	6.81	162
Standards, POW camps	2.33b	44	DDT:		
Work, definition	1.35d	13	Airplane spraying	3.64	75
Contract schools and colleges, fire pro-			Composition and forms	6.69a	158
tection	6.76	161	Fire precautions in handling	6.69	158
Contracting officers	1.36	14	Information concerning use	3.69	77
Contracts:			Decorations, flameproofing	6.68	158
Cost-plus-a-fixed-fee prohibited	1.40	15	Defrosters, motor vehicle	4.46	95
For repairs and utilities work	1.40	15	Delivery orders, coal	5.40	115
Preferred for construction work	1.35a	12	Design housing capacities	2.32a	43
Control instruments, replacement	5.50f	121	Disciplinary barracks, troop supply	1.58c	20
Controlled items	1.56a	19	Discoids, handling HCN	3.58	73
Conversion of—			Dishwashing facilities, hospitals	4.28	90
Baggage cars	4.21	86	Dismantling buildings	2.2c	33
Civilian housing	2.30b	43	Disposition of unserviceable property	1.51	17
Conversion to civilian housing	2.31	43	Distribution systems, insulation	5.52d	121
Conversions:			Domestic emergencies, sales of coal to		
Approval	1.67	25	relieve	5.30	112
POW camps	2.33c	44	Door screens	2.20	40
Converting leased premises to hospitals....	2.37	48	Doorbells, responsibility	5.5a	103
Conveyors, coal	5.54	122	Draft gauges	5.57b,c	123
Cost accounting:			Drains, floor	2.15e	38
Authority	1.71a	28	Drill fields, maintenance and repair	2.51a	53
Inactive stations	1.71c	28	Drinking fountains	2.15b	37

	Paragraph	Page		Paragraph	Page
Drivers, fire fighters	6.22	147	Preventive maintenance	4.31b	92
Dry cleaning—			Railroad maintenance	4.40	94
Machinery, vents	6.80c	162	Rental	1.41	15
Plants:			Renting	4.33	92
Fire protection	6.80	162	Repairing post engineer	4.34	92
Smoking	6.80b	162	Repairs and utilities, definition.....	1.65	25
Watchmen	6.80a	162	Restricted-issue	1.56b	19
Duckboards	2.26, 2.29g	41, 42	Restrictions on procurement	1.37	14
Dumps, regulated	3.49	72	Spare parts for snow-removal	4.42	94
Dust, control responsibility	3.30a	66	Technical:		
Economizers, procurement	5.50b	120	Installation	4.30	91
Electric—			Utility connections	4.30	91
Energy, report on purchased	1.72e	30	Temperature-control	5.49	120
Fans	4.10	82	Transfer to—		
Generators:			Navy	1.57	19
Airfields	5.4d	103	Veterans Administration	1.57	19
Hospitals	5.6	103	Troop issue	1.58	20
Organs, responsibility	5.14b	106	Use at athletic facilities	4.35	92
Services, sales	5.17	106	Used	4.32	92
Transformer capacity	5.13	105	Shop	4.8	82
Transformers	5.12	105	Erection, funds	1.14	6
Electrical equipment:			Erosion, soil	3.38	67
AAF	5.4	103	Erosion-control, responsibility	3.30a	66
Fortifications	2.59a	55	Estimates, funds	1.15	7
Requisitions	5.16	106	Excess—		
Electrical plants and systems, fortifications.	2.60	55	Installations:		
Electrical services:			Fire protection	6.78	162
Definition	5.3	103	Funds	1.23	8
Responsibility	5.3	103	Property	1.53a	17
Manufacturing plants	5.7	104	Exchanges of property	1.39	15
Elevator—			Exits:		
Maintenance	5.8c	104	Auditorium	2.43b	51
Contracts	5.8a	104	Theater	2.13	37
Manufacturing plants	5.8d	104	Expenditure refunds	1.16	7
Operators, responsibility	4.22a	87	Explosion, reports of damage	1.73	30
Emergency work, repairs and utilities			Extensions, funds	1.14	6
projects	1.63h	23	Fabrication by post engineer shops.....	4.5	81
Enemy Alien Internment Camps:			Family type NCO and officers quarters...	2.27	42
Funds	1.25	9	Fans:		
Responsibility	1.4	2	Electric	4.10	82
ENG Form 290	1.48	16	Ventilation	5.2b	102
Engineer training programs, troop-supply.	1.58	20	Farm machinery and equipment	4.41	94
Enlisted personnel:			Fencing:		
Post engineer, use	1.33	11	POW camps	2.33g	45
Fire furnaces, use	5.44h	119	When allowed at army installations....	2.49	52
Entomology and Plants Quarantine Bureau.	3.61	74	Fire-alarm—		
Equipment:			Sirens	6.54	154
Controlled	1.56a	19	Systems:		
Farm	4.41	94	Automatic	6.52	154
Fortifications	2.59	55	Manual	6.53	154
Heating, procurement	5.50	120	Fire apparatus, reserve pool	6.36	150
Installed	4.25	89	Fire chief	6.19	146
Limitation on purchase	1.37	14	Assistant	6.20	146
Limited-issue	1.56c	19	Transportation	6.38	150
Maintenance in storage	4.31c	92	Fire department—		
Manufacturing plants	4.36	93	Demonstrations	6.62	157
Mess	4.26	89	Inspections	6.63	157
OCE centrally procured	1.55	19	Instructor-inspector	6.16	145
Office	1.60	20	Operating supplies	6.31	149

	Paragraph	Page		Paragraph	Page
Organization	6.13	144	Post—		
Outside aid	6.65a	158	Commanders	6.11	144
Personnel	6.18	145	Engineers	6.12	144
Training	6.62	157	Service command	6.8	143
Fire equipment:			Engineers	6.10	144
Repair parts	6.32	149	Stand-by, excess, and surplus installa-		
Requisitions	6.33	149	tions	6.78	162
Troop supply	6.35	149	Storage installations	6.82	163
Fire extinguishers:			Utilities assistance	6.66	158
Recharging	6.86	166	Water supply systems	5.90, 6.70	133, 159
Types	6.39	150	WD program	6.1	142
Fire-fighter drivers	6.22	147	Protective devices, painting	6.31	149
Fire-fighters	6.23	147	Reporting telephone systems	6.50	154
Tours of duty	6.13	144	Reports of damage by	1.73	30
Fire-fighting—			Stations:		
Badges	6.41c	151	Hose-drying facilities	6.47	153
Clothing	6.41a,d	151	Latrines	6.48	153
Contracts, funds	6.27	148	Mess facilities	6.49	153
Equipment:			Number and size	6.45	153
Centrally procured	6.29	149	Type	6.46	153
Funds	6.25	148	Truck and equipment inspector	6.17	145
Inspection at AAF installations	6.67	158	Trucks	6.35	149
Locally procured	6.30	149	Watchers	6.24	147
Exempted installations, funds	6.28	148	Fish and Wild Life Service	3.61	74
Insignia	6.41c	151	Flagmen, railroad	3.23a	63
Personnel, funds	6.26	148	Flameproofing decorations	6.68	158
Uniforms	6.41b	151	Flood lighting, POW camps	2.33g	45
Fire—			Flood, report of damage by	1.73	30
Hazards mechanical refrigerators	6.71	160	Floor—		
Hose:			Coverings	2.17	39
Limitations	6.40e	151	Drains	2.15e	38
Types	6.40	150	Polishing equipment	4.24c	87
Ladders	6.44	152	Repairs	2.17	39
Loss records	6.64	158	Administration buildings	2.17d	40
Marshal, transportation	6.38	150	Barracks and day rooms	2.17e	40
Precautions in DDT	6.69	158	Hospitals	2.17b	39
Prevention engineer	6.15	145	Mess halls	2.17c	39
Protection:			Warehouses and shops	2.17f	40
Adjustments in program	6.2	142	Toppings	2.17	39
Construction projects	6.72	161	Wax:		
Contract colleges and schools	6.76	161	Supply	4.24a	87
Dry-cleaning plants	6.80	162	Application	4.24b	87
Facilities converted to troop housing			Floors:		
and hospitalization	6.73	161	Dustproofing concrete	2.18	40
Leased—			Shower room	2.26	42
Premises partially occupied	6.75	161	Flue-gas analysis set	5.57a,c	123
Storage facilities	6.74	161	Flues	2.10	36
Obligation of city	6.65a	158	Fluorescent—		
Places of assembly	6.77	161	Lighting, installation	5.10	105
Post laundries	6.80	162	Tubes	5.9	104
POW camps	6.79	162	Fly traps	3.57	73
Recreational buildings	6.81	162	Foam type extinguishers	6.39b	150
Responsibility:			Forestry fire protection	6.65b	158
AAF	6.5	143	Fortification equipment:		
Air forces and AAF commands	6.9	144	Coast Artillery	2.59b	55
ASF	6.4	143	Corps of Engineers	2.59c	55
Chief of Chemical Warfare Service	6.6	143	General responsibility	2.59a	55
Chief of Engineers	6.4	143	Ordnance Department	2.59d	55
Chief of Ordnance	6.6	143	Signal Corps	2.59e	55
Chief of Transportation	6.7	143			

	Paragraph	Page		Paragraph	Page
Fortifications:			Stand-by installations	1.23	8
Approval of projects	2.57	54	State Guard camps	1.27	9
Budget estimates	2.54	54	Surplus installations	1.23	8
Construction	2.52d	54	Transportation	1.21	8
Discontinuance	2.61	56	Travel	1.21	8
Distribution of funds	2.56	54	War relocation centers	1.24	9
Electrical plants and systems	2.60	55	Funds for—		
Historical	2.52b	54	Fuel procurement	5.19	108
Maintenance standards	2.53	54	Payment of personnel	1.32	11
Request for funds	2.55	54	Subscriptions to periodicals	1.68c	26
Responsibility	2.52	54	Furnace, fan operation, summer	5.61	124
Transferring completed structures	2.58	55	Furnaces, procurement	5.50d	120
Fountains, drinking	2.15b	37	Furniture:		
Freon-12:			Alteration	4.14a	83
Cylinders	5.70, 5.71	127	Critical items	4.14d	83
Supply	5.70	127	Definition of	4.11	83
Fuel—			Disposition of—		
Authorization	5.50e	120	Nonreparable	4.15c	84
Conservation measures	5.43	118	Repaired	4.15c	84
Conservation, storage system operations	5.107	136	Leased	4.14c	83
Consumption:			Local manufacture	4.5	81
Monthly inventory	5.21b	109	Maintenance responsibility	4.14a	83
Records	5.21	109	Not standard	4.19	85
For export	5.19d	109	Procurement of	4.12a	83
For technical activities	5.19e	109	Spare parts	4.12b	83
Sales to individuals	5.29	112	Repair	4.14a	83
Fuels and lubricants, responsibility	4.43	95	At station level	4.15a	83
Funds:			Beyond station level	4.15b	83
Air force facilities	1.12	6	Special equipment	4.14b	83
Alien Internment Camps	1.25	9	Fusible links, painting	6.61	156
Applicability	1.14	6	Garbage—		
Approval and authorization	1.63	22	Collection	3.45	71
Barracks and quarters	1.14	6	Grinders	3.53	72
CAP	1.19	8	Garden hose	4.47	95
Conscientious objector camps	1.25	9	Gardening, hand tools	1.58b	20
Distribution	1.18	7	Gardens, vegetable	3.39	68
Distribution of fortifications	2.56	54	Gas—		
Enemy Alien Internment Camps	1.25	9	Consumption, inspection by supplier	5.47	120
Estimates	1.15	7	Distribution systems, manufacturing		
Estimates for fortifications	2.54	54	plants	5.67	125
Excess installations	1.23	8	Masks and canisters	5.69, 6.42	126, 151
Expenditure refunds	1.16	7	Meters	5.57c	123
Ground forces facilities	1.12	6	Purchase, storage, and issue	5.18d	108
Internment camps	1.25	9	Gauges:		
Leased facilities	1.12	6	Draft	5.57b,c	123
Liquid fuels and lubricants	1.22	8	Water-level	5.80	130
Military posts	1.14	6	General mechanics, heating	5.45	119
Nonappropriated	1.20	8	Grass—		
Notification of expenditure	1.17	7	Burning	3.35	67
Other than appropriated, used for repairs			Maintenance	3.38b	67
and utilities projects	1.63g	23	Mowing, responsibility	3.30a	66
Passive protection	1.12	6	Grease interceptors	2.15f	38
Personal equipment	1.26	9	Ground force facilities, funds	1.12	6
Petroleum products	1.22	8	Grounds:		
POW camps	1.25	9	Hospital	3.36	67
Reimbursements	1.16	7	Maintenance:		
Repairs and utilities	1.12	6	Personnel	3.31	66
Request for fortifications	2.55	54			
Seacoast defense	1.12	6			

	Paragraph	Page		Paragraph	Page
POW	1.34d	12	Incinerators:		
Responsibility	3.30	66	Construction	3.48c	71
Manufacturing plants	3.41	68	Operation	3.48a	71
Parade	3.37	67	Safety factors	3.48b	71
Policing	3.33	66	Insect and rodent control:		
Hand tools for gardening	1.58b	20	Equipment	3.56	73
Handrails for stairs	2.13b	37	Qualified personnel	3.65	76
Harvesting crops, responsibility	3.38b	67	Manufacturing plants	3.59	74
HCN discoids, handling	3.58	73	Materials	3.56	73
Heat, sales to individuals	5.29	112	Near military reservations	3.62	74
Heat distribution systems, manufacturing plants	5.67	125	Property in storage	3.60	74
Heating—			Responsibility	3.55	73
Equipment:			Supplies	3.55c	73
Procurement	5.50	120	Insect screens	2.20	40
Summer maintenance	5.48	120	Inspection of coal	5.42a	116
General mechanics	5.45	119	Inspections:		
Hospital corridors	5.64	124	Boiler	5.58	123
Plant logs	5.52a	121	Fire department	6.63	157
Plants:			Installation, funds	1.14	6
Full-time operator not required	5.44h	122	Installed property, accountability	1.46	16
Manufacturing plants	5.67	125	Insulation	2.14	37
Operating personnel	5.44	118	Insulation of distribution systems	5.52d	121
Warehouses	5.66	125	Integrated maintenance shops	4.1	80
Heaters, motor vehicles	4.46	95	Interceptors, grease	2.15f	38
High-lift dump trucks, coal-handling	5.35	114	Internment camps:		
Hods, coal	5.63	124	Enemy alien, responsibility	1.4	2
Hose:			Funds	1.25	9
Fire	6.40	150	Irrigation policy	5.78a	130
Limitations	6.40e	151	Items, restrictions on procurement	1.37	14
Garden	4.47	95	Janitorial supplies, responsibility	4.23	87
Hose drying facilities	6.47	153	Janitors, responsibility	4.22a	87
Hospital:			Job training	1.31	10
Converting leased premises	2.37	48	Jointly occupied Army-Navy airfields, responsibility	1.7	3
Corridors, heating	5.64	124	Joints in concrete pavements	3.4	58
Dishwashing facilities	4.28	90	JP-1 fuel, storage	5.113	139
Electric generators	5.6	103	Key making facilities	4.9	82
Fire protection at facilities adapted	6.73	161	Keys, provision	4.9	82
Grounds	3.36	67	Kitchen ranges, procurement	5.50a	120
Refrigerated facilities	5.68b	126	Labor—		
Ventilation	5.2	102	For construction	1.35	12
Hot water—			Policy:		
Heating systems	5.60	124	Contract basis	1.35a	12
Supply systems	2.51d	38	POW	1.34b, 1.35b	11, 12
Housekeeping supplies, transfer to—			Troops	1.35c	12
Navy	1.57	19	Ladders, fire	6.44	152
Veterans Administration	1.57	19	Lamp—		
Housing—			Bulbs and tubes	5.9	104
Capacities	2.32	43	Sizes	5.9e	105
For POW guards	2.33f	45	Landing fields, mowing	3.40	68
Ice—			Laundries:		
Alleviation, airfields	3.29	65	Fire protection	6.80	162
Plant, manufacturing plants	5.73	128	Smoking	6.80b	162
Identification lights	5.11	105	Watchmen	6.80a	162
Inactive installations:			Laundry—		
Fire protection	6.78	162	Boiler plants, steam pressure	5.65d	124
Maintaining	2.4	33			
Incandescent bulbs	5.9	104			

	Paragraph	Page		Paragraph	Page
Facilities:			Elevator operation	5.8d	104
Operation	5.65	124	Equipment	4.36	93
Maintenance	5.65	124	Fire-fighting equipment	5.85b	166
Repairs	5.65c	124	Fire protection	6.85	166
Operations, water softeners	5.91	133	Gas distribution systems	5.67	125
Lawns, hospital	3.36	67	General policy	1.9a,b	4
Leased—			Grounds	3.41	68
Airfields, maintenance	3.8a	59	Heat distribution systems	5.67	125
Facilities:			Heating plants	5.67	125
Funds	1.12	6	Ice plants	5.73	128
Railroads	3.25	64	Insect and rodent control	3.59	74
Furniture	4.14c	83	Janitor service	2.41	50
Premises:			List of facilities	1.9d	4
Converting to hospitals	2.37	48	Motor vehicles	4.36	93
Limitations on Government's restora-			Parking areas	3.15	61
tion responsibility	2.38b	48	Railroads	3.22	63
New work projects	1.64d	24	Refrigeration	5.73	128
Partially occupied, fire protection	6.75	161	Roads and walks	3.15	61
Performance of restorations	2.38c,d	48	Sewerage	5.77	129
Real property records	1.50	16	Shops	4.7	82
Responsibility of government for res-			Snow removal	3.15	61
toration	2.38a	48	Storm water drainage	5.77	129
Roads and walks	3.13	61	Water supply	5.77	129
Storage facilities, fire protection	6.74	161	Window cleaning	2.41	50
Leases, POW camps	1.3	2	Marginal lands, vacant buildings on	2.50	53
Lighting limitations	5.10	105	Marking—		
Lights, identification	5.11	105	Airfield hazards	3.6b	59
Limited issue items	1.56c	19	Runways and taxiways	3.6a	58
Linoleum, installing	2.17	39	Materials, restrictions on procurement	1.37	14
Liquid fuels, funds	1.22	8	Meat—		
Local—			Hooks	5.68e	126
Manufacture of furniture	4.5	81	Tracks, overhead	5.68e	126
Purchases	1.38	14	Mechanical refrigerators, supply	5.72	128
Locomotives, boiler inspections	5.58	123	Mess equipment:		
Machinery:			Accountability	4.26g	90
Farm	4.41	94	Cost accounting	4.26h	90
Used	4.32	92	Definition	4.26a	89
Maids for civilian dormitories, responsi-	4.22a	87	Installation	4.26c	89
bility	2.4	33	Maintenance	4.26e	90
Maintaining inactive installations			Messes operating under AR 210-60	4.26i	90
Maintenance, economy in	2.1b	32	Removal	4.26c	89
Maintenance and repair:			Repair	4.26e	90
Application of construction policy	2.1a	32	Parts	4.26f	90
Criteria	2.1b	32	Replacement	4.26e	90
Funds	1.14	6	Responsibility	4.26b	89
Maintenance work, definition	1.35d	13	Supply	4.26d	89
Manufacturers—			Mess tables and stools, maintenance	4.17	84
Lubrication orders, requisitions	1.69c	28	Messing facilities for civilians	2.40	51
Manuals, requisitions	1.69b,c	28	Meter—		
Preventive Maintenance Manuals, req-			Readings	5.102	135
uisitions	1.69c	28	Testing and refunds	5.79	130
Manufacturing plants:			Metering discounts	5.100	135
Accomplishment of projects	1.9c	4	Metering of water	5.101	135
Boiler plants	5.67	125	Meters:		
Building and structures	2.41	50	Gas	5.57c	123
Coal	5.33	114	Steam-flow, air-flow	5.57a	123
Custodial services	2.41	50	Military posts, funds	1.14	6
Electrical services	5.7	104			

	Paragraph	Page		Paragraph	Page
Miscellaneous maintenance, repair and fabrication by post engineer shops.....	4.5	81	Cooperation with, in fire protection....	6.84	166
Mock-ups:			Manufacturing plants	1.9	4
Maintenance and repair	2.51a	53	Proving grounds	1.9	4
Supply of utilities services	2.51b	53	Organs, electric, responsibility	5.14b	106
Monthly inventory of fuel consumption....	5.21b	109	OSS facilities:		
Motor—			Projects	1.6	3
Fire apparatus, reserve pool	6.36	150	Responsibility	1.6	3
Pools	4.39	94	Outdoor—		
Vehicles:			Athletic facilities, pregame grooming....	2.44	51
Administrative	4.38f	94	Recreational—		
Defrosters	4.46	95	Equipment, portable	2.44	51
Disposition	4.38d	93	Facilities	2.44	51
Heaters	4.46	95	Outposts, supply of coal	5.20	109
Modification	4.38b	93	Outside fire departments	6.65a	158
Personal transportation	4.38e	93	Oven, installing bakery	4.29	91
Repair	4.38c	93	Overhead utilities, movement near	3.43	70
Responsibility	4.38a	93	Packing and crating, responsibility	4.20	86
Weapons carriers	4.38g	94	Painting:		
Moving buildings	2.2c	33	Exterior	2.16a	38
Mowing landing fields	3.40	68	Interior:		
Mules, responsibility	4.48	96	Permanent buildings	2.16c	38
National Board of Fire Underwriters....	6.14	144	Temporary—		
National cemeteries	3.42c	70	Buildings	2.16b	38
National Guard camps:			Exchanges	2.16b(3)	38
Disposition	2.5	34	Hospital buildings	2.16b(1)	38
Responsibility	1.11	5	Kitchens and mess halls	2.16b(2)	38
Navy, transfer of housekeeping supplies and equipment	1.57	19	Painting fire protective devices	6.61	156
Navy-Army airfields	1.7	3	Panic bolts	2.13b	37
New—			Parade grounds	3.37	67
Construction projects:			Parking areas, manufacturing plant....	3.15	61
Approval	1.63	22	Passive protection:		
Authorization	1.63	22	Definition	3.66	77
Routing	1.63	22	Demobilization	3.68	77
Work projects—			Funds	1.12	6
At leased premises	1.64d,e	24	General requirement	3.67	77
In excess of \$200.00.....	1.64a	24	Renewal	3.68	77
Night lighting equipment, responsibility..	5.4c	103	Training projects	3.69	77
Nomenclature, standard	1.43	15	Pastry cabinets, installation	4.16b	84
Nonappropriated funds	1.20	8	Pavement markings	3.32	66
Nonstandard furniture, maintenance	4.19	85	Paving materials, test and development...	3.16	62
Notification of expenditures	1.17	7	Periodicals:		
Numbering buildings	1.70	28	Definition	1.68b	25
Obscure glass windows	2.21c	41	Subscriptions	1.68	25
Obstacle courses, maintenance and repair..	2.51c	53	Permanent buildings, definition	2.6a	35
OCE centrally procured items	1.55	19	Personal equipment:		
OCE Form 423	5.26	111	Funds	1.26	9
Office supplies and equipment.....	1.60	20	Purchase	1.26	9
Off-reservation roads	3.9	60	Personnel:		
Operation—			Ceilings	1.29	10
Funds	1.14	6	Enlisted, use by post engineer	1.33	11
Logs	1.72	29	For operation of heating and boiler plants	5.44	118
Orchards, cultivation and harvesting	3.38b	67	Funds for payment	1.32	11
Ordnance Department—			General	1.28	10
Armories	1.9	4	Job training	1.31	10
Arsenals	1.9	4	Management	1.28	10
			Officer responsibility	1.28, 1.31b	10, 11
			Organization	1.29	10

	Paragraph	Page		Paragraph	Page
Procurement	1.30	10	POW—		
Qualified for insect and rodent control			Base camps	1.3, 2.33	2, 44
work	3.65	76	Branch camps	1.3, 2.33	2, 44
Recruiting	1.30	10	Camps:		
Selection	1.30	10	Construction standards	2.33b	44
Utilization of boiler plants	5.41i	119	Conversion	2.33c	44
Workload studies	1.29	10	Fencing	2.33g	45
Work-measurement	1.29	10	Fire protection	6.79	162
Yard sticks	1.29	10	Floodlighting	2.33g	45
Pest control, responsibility	3.55	73	Funds	1.25	9
Petroleum products:			Housing for guards	2.33f	45
Funds	1.22	8	Leases	1.3	2
Purchase, storage and issue	5.18e	108	Responsibility	1.3	2
Storage and distribution systems:			Security measures	2.33d	45
Access	5.110a	137	Tent camps	2.33e	45
Roads	5.110	137	Types	2.33a	44
Alterations	5.108	137	Use of POW labor	2.33h	45
Design	5.105c, 5.110	136, 137	Class III installations	1.34c	12
Drainage	5.110c	137	Chapels	2.46	52
Electrical connections	5.110g	138	Ground maintenance	1.34d	12
Fuel lines	5.110d	137	Labor:		
Gasoline meters	5.110f	138	Policy	1.34b, 1.35b	11, 12
Hazards	5.106	136	Use	2.33d	45
Inactive installations	5.111c	138	Use by post engineer	1.34a	11
Inspection	5.105a	136	Use in grounds maintenance	3.33a	66
Maintenance	5.105a, 5.111	136, 138	Preventive maintenance:		
New construction	5.114	139	Equipment in storage	4.31c	92
Operation	5.105a, 5.108, 5.112	136, 137, 139	Publications	1.69	27
Personnel	5.109	137	Preventive maintenance of—		
Preventive maintenance	5.105b	136	Equipment	4.31b	92
Procurement	5.105c	136	Heating equipment	5.48	120
Pumps and motors	5.110c	138	Private cemeteries	3.42b	69
Repair	5.105a, 5.108	136, 137	Procurement of items	1.37	14
Replacement of equipment	5.108	137	Procurement responsibility	1.36	14
Service station type	5.105d	136	Programs, repairs and utilities projects	1.63f	23
Storage and issue	5.105c	136	Property:		
Supply and fuel	5.105e	136	Accountability	1.45, 1.46	16
Vents	5.110b	137	Classification	1.44	16
Places of public assembly, fire protection	6.77	161	Excess	1.53	17
Plumbing fixtures	2.15	37	Exchanges	1.39	15
Pokers	5.63	124	Redistribution	1.53a	17
Pole lines:			Supply	1.53b	18
Joint use	5.5b	103	Unserviceable, disposition	1.51	17
Property records	5.5c	103	Proving grounds, CWS and Ordnance	1.9	4
Policing airfield pavements	3.5	58	Pruning, responsibility	3.38b	67
Policing of grounds	3.33	66	Public—		
Polishing machines, floor	4.24	87	Property, reports of damage	1.73	30
Port water supply, safeguarding	5.89	132	Roads administration, responsibility	3.9a	60
Post—			Military reservations	3.10	60
Cemeteries	3.42a	68	Public Health Service	3.62	74
Commander's authority limited	2.36b	47	Publications for preventive maintenance	1.69	27
Definition	1.62	22	Purchase orders, coal	5.40	115
Exchanges:			Purchases:		
Alterations, extensions and adaptations	2.42d	50	Local	1.38	14
Maintenance and operation of buildings			Restrictions	1.37	14
and utilities	2.42a	50	Purchasing and contracting—		
Materials, supplies and equipment	2.42c	50	Officers	1.36	14
New construction	2.42b	50	Responsibility	1.36	14
Posts, classification	1.68c	25	QMG Form 400	1.42	15

	Paragraph	Page		Paragraph	Page
Quarters:			Refuse:		
Bachelor officer	2.28	42	Burn and cover	3.52	72
Family type:			Burning pits	3.51	72
Construction	2.27a	42	Collection:		
Conversion	2.27a	42	Methods	3.45	71
Maintenance and repair	2.27c	42	Responsibility	3.44	71
Rehabilitation	2.27b	42	Disposal—		
WAC	2.29	42	Facilities	3.46	71
Racks, arms	2.10	36	Responsibility	3.44	71
Radar installation, maintenance and repair	2.52c	54	Removal from post	3.50	72
Rail and track materials	3.20	63	Segregation	3.45	71
Railroad—			Stands and receptacles	3.54	72
Flagmen	3.23a	63	Regional post engineer offices	1.10b	4
Maintenance agreements	3.19	63	Reimbursements	1.16	7
Trestles, use in coal delivery	5.38	115	Relocation, funds	1.14	6
Watchmen	3.23b	63	Removal, funds	1.14	6
Railroads:			Renovation of grounds responsibility	3.30a	66
Certificates of Necessity	3.25	64	Rentals of equipment	1.41	15
Changes in	3.24	63	Renting equipment	4.33	92
Construction	3.18b	63	Repairs and utilities—		
Maintenance—			Consolidated reports	1.72	29
Equipment	4.40	94	Cost accounting	1.71	28
Responsibility	3.18	63	Cost cards	1.71b	28
Manufacturing plants	3.22	63	Equipment, definition	1.65	25
Operation	3.18a	63	Funds	1.12	6
Replacement of substandard rail	3.26	64	Operation logs	1.72	29
Range, Army:			Projects:		
Responsibility	4.26a	89	Approval	1.63	22
Spare parts	4.26f	90	Approval of programs	1.63f	23
Ranges, kitchen, procurement	5.50a	120	Authorization	1.63	22
Real estate:			Based upon another	1.10c	4
Limitations on acquisition	2.34a	46	Cost	1.65	25
Standards, acquiring buildings	2.34b	46	Emergency work	1.63h	23
Real property:			In excess of \$200	1.64	24
Accountability	1.42	15	New work at leased premises	1.64d	24
Transfer	1.48	16	Partially financed by other than ap-		
Records for leased premises	1.50	16	propriated funds	1.63g	23
Transferring completed fortifications	2.58	55	Reporting	1.64c	24
Receiving reports, coal	5.41	115	Requiring requisitions	1.66	25
Receptacles, refuse collection	3.54	72	Review for class III installations	1.63e	23
Recharging fire extinguishers	1.66	686	Routing	1.63	22
Reconstruction, funds	1.14	6	Responsibilities, general	1.1	2
Recreational buildings:			Reports of—		
Auditorium exits	2.43c	51	Damage to public property	1.73	30
Bowling alleys	2.43c	51	Purchased electric energy	1.72e	30
Existing facilities	2.43a	51	Requisitions	1.42, 1.53b	15, 18
Fire protection	6.81	162	For coal	5.23	110
New construction	2.43a	51	Requiring repairs and utilities projects	1.66	25
Redistribution of excess coal	5.31	113	Review of coal	5.25	111
Redistribution property	1.53a	17	To cover overdeliveries of coal	5.24	111
Re-erection of buildings	2.2c	33	Re-roofing	2.9	36
Refrigerated—			Reservation boundaries	2.3	33
Facilities, hospitals	5.68b	126	Reservoirs for swimming	5.82	130
Warehouse facilities	5.68	126	Restoring leased premises	2.38	48
Refrigeration facilities, manufacturing			Restricted-issue items	1.56b	19
plants	5.73	128	Revegetation:		
Refrigerators:			Limitations	3.30b	66
Fire hazards	6.71	160	Responsibility	3.30a	66
Mechanical, supply	5.72	128	Rigid pavement laboratory	3.16	62

	Paragraph	Page		Paragraph	Page
Roads:			Shooting galleries and ranges, maintenance and repair	2.51a	53
Off-reservation:			Shop Stocks	4.4	81
Claims	3.9c	60	Shops:		
Responsibility of Public Roads Administration	3.9a	60	Establishment	4.1	80
Use of War Department funds	3.9b	60	Integrated maintenance	4.2	80
Manufacturing plants	3.15	61	Manufacturing plants	4.7	82
Private cemeteries within military reservations	3.42b	69	Miscellaneous maintenance by post engineer	4.5	81
Public, on military reservations	3.10	60	Responsibility	4.2	80
Standards of maintenance	3.12a	60	Used tools and equipment	4.8	82
Rodent control, responsibility	3.55	73	Shops at class IV installations	4.6	82
Roof—			Shovels, coal	5.63	124
Jacks	2.10	36	Shower curtains	2.23	41
Repairs	2.9	36	Shower room floors	2.26	41
Trusses	2.8	36	Shrubs, maintenance	3.38b	67
Routing of—			Signs:		
New construction projects	1.63	22	Identification and directional	2.24	41
Repairs and utilities projects	1.63	22	Traffic control	3.32	66
Safeguarding port water supplies	5.89	132	Sirens, fire alarm	6.54	154
Sale of—			Smoking in—		
Coal to relieve domestic emergencies	5.30	112	Dry-cleaning plants	6.80b	162
Electric services	5.17	106	Laundries	6.80b	162
Sewage disposal services	5.76	129	Warehouses	6.83	164
Surplus—			Snow removal:		
Utilities services	5.104	135	Airfields	3.28	65
Water services	5.75	129	Equipment spare parts	4.42	94
Salvage—			Manufacturing plants	3.15	61
Collections	3.45	71	Responsibility	3.27	65
Of buildings or improvement	2.2a	32	Soot blowers	5.54	122
Segregation	3.45	71	Space allowances	2.32b	44
Salvaged building materials	2.2b	33	Spare boiler-plant capacity	5.56	122
Sampling of coal	5.42b	116	"Spartan simplicity" doctrine	2.1b	32
Sanitary-fill, operation	3.47	71	Spraying crops	3.38b	67
Scale in water supply systems	5.88	132	Sprinkler—		
Scales:			Heads, painting	6.61	156
Permanently installed:			Systems:		
Railroad	5.36b	114	Acceptance	6.57	155
Truck	5.36a	114	Approval of projects	6.59	156
Track	5.68e	126	Installation criteria	6.55	155
Screens, insect:			Maintenance	6.56	155
Fire-prevention features	2.20c	40	Testing	6.57	155
Installation	2.20a	40	Sprinklered buildings, alterations	6.60	156
Maintenance	2.20a	40	Stacks	2.10	36
Stand-by storage	2.20b	40	Stairs, handrails	2.13b	37
Winter storage	2.28	42	Standard nomenclature	1.43	15
Security measures, POW camps	2.33d	45	Stand-by installations:		
Service command warehouses	1.54	18	Fire protection	6.78	162
Sewage—			Funds	1.23	8
Chlorination	5.84	131	Standpipes, installation	6.58	155
Disposal services:			Stands, refuse collection	3.54	72
Manufacturing plants	5.77	129	State Guard camps:		
Sale	5.76	129	Funds	1.27	9
Shades, window	2.21	41	Repairs and utilities	1.27	9
Shelves:			State Highway Department, engineer assistance	3.11	60
Built-in, accountability	1.47	16	Station control levels	1.52	17
Installation	4.16	84	Stations based upon another	1.10	4
Refrigerated storage space	5.68f	126	Steam, utilization of waste	5.52c	121

	Paragraph	Page		Paragraph	Page
Steam-flow, air-flow meters	5.57a	123	Tools:		
Stock—			Hand, for gardening	1.58b	20
Control	1.52	17	Used	4.32	92
Numbers	1.43	15	Used shop	4.8	82
Stocks, accountability	1.45	16	Track scales	5.68e	126
Stokers, installation policy	5.59	123	Traffic control:		
Stools, mess, installation	4.17	84	Disciplinary measures	3.34a	67
Storm, reports of damage by	1.73	30	Signs	3.32	66
Storm-water drainage, manufacturing			Vehicles	3.34b	67
plants	5.77	129	Training—		
Subscriptions to periodicals	1.68	25	Aids:		
Summer maintenance of heating equipment.	5.48	120	Definition	2.51a	53
Supplies:			Fabrication	2.51c	53
Office	1.60	20	Maintenance and repair	2.51	53
OCE centrally procured	1.55	19	Passive protection	3.69	77
Housekeeping, transferred to—			Spare parts	2.51c	53
Navy	1.57	19	Supply of utilities services	2.51c	53
Veterans Administration	1.57	19	Fire department	6.62	157
Supply of—			Unit schools and colleges	2.39a	48
Cylinders, general	1.61	20	Alterations	2.39a	48
Property	1.53b	18	Inspections	2.39b	49
Surplus—			Repairs	2.39a	48
Coal	5.32	113	Supply	2.39c	49
Installations	6.78	162	Termination	2.39d	49
Funds	1.23	8	Transfer of accountability for—		
Utilities services, sale	1.104	135	Real property	1.48	16
Swimming pools:			Surplus installations	1.49	16
Approval of water supply	5.82a	130	Transformers, electric	5.12	105
Aprons	2.26	41	Capacity	5.13	105
Construction	5.82b	130	Transportation:		
Operation	5.82a	130	For fire chief and fire marshal.....	6.38	150
Repairs	5.82c	130	Funds	1.21	8
Tables, mess, installation	4.17	84	Transportation Corps, cooperation within		
Tanks for swimming	5.82	130	fire protection	6.84	166
Target ranges, maintenance and repair....	2.51	53	Traps, fly	3.57	73
Targets, supply and maintenance.....	2.51d	53	Travel, funds	1.21	8
Technical Bulletins:			Trees:		
ENG, requisitions	1.69a	27	Maintenance	3.38b	67
Requisitions	1.69a	27	Shade, at hospitals	3.36	67
Technical equipment:			Trestles, railroad, use in coal handling...	5.38	115
Installation	4.30	91	Troop—		
Utility connections	4.30	91	Housing, fire protection at facilities		
Technical Manuals:			adapted	6.73	161
Requisitions	1.69a	27	Issue of equipment	1.58	20
Nonofficial, requisitions	1.69b	27	Supply:		
Telephone—			Disciplinary barracks	1.58c	20
Facilities, installation	2.48	52	Engineer training programs	1.58	20
Systems:			Hand tools for gardening	1.58b	20
Fire reporting	6.50	154	Incidental to repairs and utilities.....	1.58a	20
Use of No. 17	6.51	154	Trucks, high-lift dump, for coal handling..	5.35	114
Temperature recorders	5.57a	123	Trusses, roof	2.8	36
Temperature-control equipment	5.49	120	Tubes, lamp	5.9	104
Temporary buildings, definition	2.6b	35	Tubes and tires	4.44	95
Tent camps, POW	2.33e	45	United States Military Academy, respon-		
Theater exits	2.13	37	sibility	1.2	2
Theater of operations buildings	2.7	36	Unserviceable property:		
Threshold, conditioning of water	5.88	132	Determination of disposal	1.51c	17
Tires and tubes	4.44	95	Disposition	1.51	17
Toilet facilities	2.15a	37	Fair wear and tear	1.51a	17

	Paragraph	Page		Paragraph	Page
Inspection	1.51c	17	Service command	1.54	18
Other than fair wear and tear, disposition	1.51b	17	Smoking	6.83	164
Utilities—			Stack clearances	6.82b	163
Contracts:			Washing walls	2.25	41
Meter testing and refund	5.101	135	Watchmen:		
Metering discounts	5.102	135	Fire	6.24	147
Negotiating procedure	5.103	135	For laundries and dry cleaning plants...	6.80	162
Services:			Railroad	3.23b	63
Assistance in fire protection.....	6.66	158	Watch-report systems	6.53	154
Sale of surplus	5.104	135	Water—		
Vacant buildings on marginal lands.....	2.50	53	Chlorination	5.83	130
Vehicles:			Conservation measures	5.78	130
General-purpose	4.38	93	Front fire protection	6.65c	158
Motor	4.38	93	Level gauges for wells	5.80	130
Special—			Mains, ammunition storage areas.....	5.81	130
Equipment	4.38	93	Metering policy	5.79	130
Purpose	4.38	93	Samples for chemical analyses.....	5.87	132
Vending machines, furnishing electric services	5.17b	106	Services:		
Venetian blinds	2.22	41	General policy	5.74	129
Ventilation—			Sale of surplus	5.75	129
Equipment, installation policy	5.1	98	Softeners for laundry operations.....	5.91	133
Fans	5.2b	102	Supply:		
Hospitals	5.2	102	Manufacturing plants	5.77	129
Vents on dry cleaning machines	6.80c	162	Piping	2.15c	38
Vestibules, entrance	2.12	36	Safeguarding at ports	5.89	132
Veterans Administration, transfer of housekeeping supplies and equipment....	1.57	19	Systems:		
Vicinity post engineers	1.10	4	Hot	2.15d	38
Vineyards, cultivation and harvesting.....	3.38b	67	Operation for fire protection.....	5.90	133
WAC—			Scale and corrosion	5.88	132
Administration and supply	2.29d	42	Wax, floor	4.24	87
Hair dressing facilities	2.29f	42	WD AGO Form—		
Hospital facilities	2.29h	42	15	1.51b, 2.2a	17, 32
Laundry facilities	2.29g	42	445	1.42	15
Messing facilities	2.29c	42	445, shop equipment	4.3	80
Quarters	2.29	42	447	1.51a	17
Recreational facilities	2.29e	42	5-2	1.73	30
Walks:			5-25:		
Manufacturing plants	3.15	61	Accompanied by fire inspection report	6.63b	157
Private cemeteries within military reservations	3.42b	69	Emergency work	1.63h	23
Standards of maintenance	3.12b	61	Equipment requisitions	5.16	106
Wall lockers, maintenance	4.16	84	Funds	1.18	7
Walls, washing	2.25	41	Insect and rodent control	3.62c	75
War Department Power Procurement Officer	5.94	134	Installed equipment	4.25	89
War relocation centers:			Issue of spare parts	4.26g	90
Funds	1.24	9	Mess equipment	4.26c,d	89
Responsibility	1.5	2	New work—		
Warehouse:			At leased premises	1.64d	24
Access aisles	6.82d	163	In excess of \$200	1.64a	24
Aisles	6.82c	163	OSS	1.6	3
Facilities, refrigerated	5.68	126	Submission with requisition	1.37	14
Fire—			Supporting request for Certificate of Necessity	2.36a	47
Doors	6.82f	164	5-26	1.18, 1.64a	7, 24
Protection	6.82	163	5-47 through 5-52.....	1.46, 1.48, 1.49, 1.50	16
Heating	5.66	125	5-48	1.50	16
			5-50	1.72	29
			5-55	1.72	29
			5-56	1.72	29
			5-57	1.72	29

	<i>Paragraph</i>	<i>Page</i>		<i>Paragraph</i>	<i>Page</i>
5-58	1.72	29	14-114	1.18	7
5-60	1.72	29	Welfare agency facilities:		
5-61	1.72	29	Maintenance and repair	2.47	52
5-65	1.52	17	Utilities	2.47	52
5-66	1.64c	24	Wind, reports of damage	1.73	30
5-97	1.72	29	Window—		
5-98	1.72	29	Obscure glass	2.21c	41
5-104	1.45, 1.49	16	Screens	2.20	40
5-112	1.17	7	Shades:		
10-113, coal	5.41d	116	Hospital building	2.21a	41
10-156	5.21b	109	Installation	2.21d	41
10-211	5.23	110	WAC buildings	2.21b	41
Locomotives	5.34	114	Window cleaners, responsibility	4.22a	87
Outposts	5.20	109	Winter maintenance, airfields	3.28	65
Overdeliveries	5.24	111	Wood, purchase, storage and issue	5.18f	108
Resale	5.29c	112	Work—		
Review	5.25	111	Load studies	1.29	10
Supplemental	5.22	110	Measurement standards	1.29	10
14-106	1.18	7			

